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THE MEDICAL JOURNAL OF AUSTRALIA

VOL. I.—11TH YEAR. SYDNEY: SATURDAY, MAY 17, 1924. No. 20.

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Table of Contents

SOME OBSERVATIONS ON THE PARA-THYREOID AND ITS USE IN MENTAL CONDITIONS.[1]

By E. J. T. THOMPSON, M.C., M.A., B.Sc., M.B., Ch.M. (Sydney),
Perth.

Part I.

IN presenting this paper before the Association, I do so with a considerable amount of temerity and some apprehension of the criticism that may be forthcoming, from those who have the patience to be my audience. To enter into the field of endocrinology seems to me, to say the least of it, to resemble the stirring up of a peaceable wasps' nest where so many general practitioners are concerned. But I wish it to be understood that what is being put forward is not in the way of definite conclusions, but rather suggestions that appear from a study of the literature of the subject to have at least some rational basis supported by clinical results.

If you will allow me to take you back to your student days and re-introduce you to your old laboratory friend, Scyllium, the dog-fish, it will be possible to trace up briefly the development of the para-thyreoids from a comparative point of view.

[1] Read at a meeting of the Western Australian Branch of the British Medical Association on March 23, 1924.

One of the constant features of the vertebrate group is the formation at an early stage in development of ectodermal and entodermal pouches in the region of the neck. In the lower vertebrates as exemplified by the dog-fish these elements form a series of gill-clefts by means of which the physiological function of respiration is carried on. In their development it is found that they are formed by an invagination of the surface ectoderm, corresponding to which there is an entodermal evagination from the anterior end of the primitive alimentary canal, separated at first by a membrane (see Figure I.). This membrane breaks down, leaving a continuous passage between the alimentary tract and the exterior. Between each cleft is formed the gill septum of mesodermal tissue in which the gill cartilage is developed and to each of which is supplied an arterial arch from the ventral aorta. Figure I. then represents diagrammatically a stage which is constant throughout the vertebrate group.

Without considering the vagaries of this region in the different sup-phyla, we may pass directly to the human, and in Figure II. I have represented an embryo of about three weeks showing the ecto-dermal pouches in relation to the arterial arches and in Figure III. a later stage at about one month. If a section were taken in the direction of the line *A—B* and the anterior portion viewed from behind, we would be looking upon the floor of the primitive

pharynx and a section of the thickened visceral arches, between which can be seen the small entodermal pouches (see Figure IV.). A reconstruction by Tandler shows a side view of these pouches in relation to the arterial arches (see Figure V.).

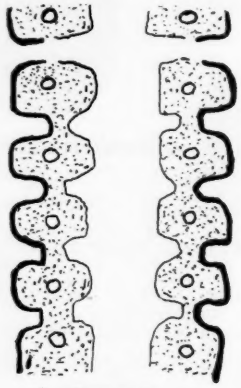

FIGURE I.
Diagrammatic Representation of Gill-clefts in the Dog Fish.

It is in connexion with these entodermal pouches that the endocrine glands in the neck are developed. The first pouch has no glandular development and is the embryonic rudiment of the Eustachian tube of the adult. From the second pouch the tonsil is developed. The thyreoid gland arises from a median portion and two lateral portions. The

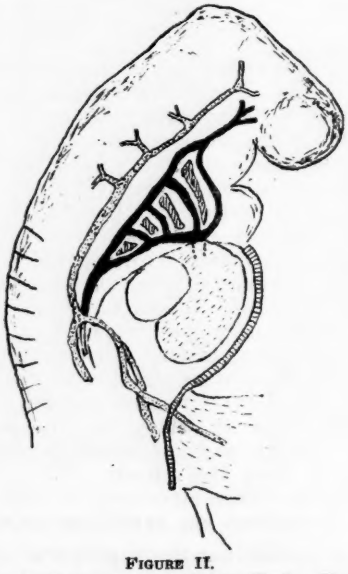

FIGURE II.
Human Embryo of about Three Weeks, Showing Ectodermal Pouches in Relation to the Arterial Arches. (After T. H. Byrne.)

median portion appears as a pocket from the floor of the pharynx between the ventral ends of the second visceral or hyoid arch, in close connexion with the root of the tongue and is represented in the adult by the *foramen caecum* of the tongue, the thyreo-glossal duct, the median lobe of the thyreoid (when present), the isthmus and probably a portion of the lateral lobes. The lateral lobes are developed from the lateral portions of the fourth pouch as hollow tubular structures which early become nipped off from the pharynx and pass ventrally to

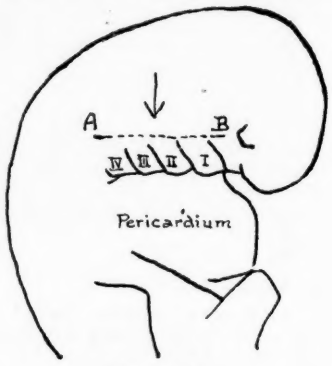

FIGURE III.
Human Embryo at about One Month (Diagrammatic).

unite with the median portion. The thymus is likewise a bilateral structure, developed as hollow pouches from a posterior part of the third pouches on each side. They early become separated from the pharynx and later unite to form a single structure lying in front of the pericardium (see Figures VI. and VII.). It is interesting in this connexion to note that in lower vertebrates the thymus takes origin from a series eof entodermal pouches and even in some mammals it has been described as arising from both the third and fourth clefts. The para-thyreoids are developed in connexion with the posterior portions of the third and fourth entodermal pouches on each side as epithelial buds which very early become separated from the pharynx. They differ from the thyreoid and the

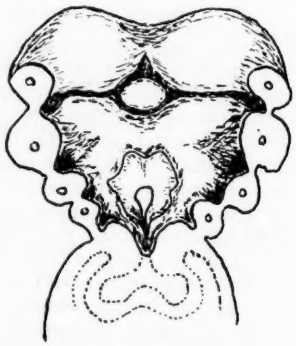

FIGURE IV.
Floor of Pharynx of Human Embryo. (After His.)

thymus in that they do not show the hollow vesicular structure of these glands in their early stages. Para-thyreoid III., being developed in connexion with the thymus, is carried caudally with it and so occupies a position more distal than para-thyreoid

IV. which arises from the same pouch as the lateral portion of the thyreoid.

Apart from the general interest of development, I have put before you these embryological considerations for two reasons: (i.) In connexion with accessory para-thyreoids; (ii.) with regard to the administration of the extracts of the glands.

Firstly, while in view of more recent experiments we cannot agree with Forsyth[1] in his conclusions on the functions of the para-thyreoids, it is interesting to note that in his paper he describes in addition to the four normal para-thyreoids as many as four accessory para-thyreoids, while he and others have described para-thyreoid tissue included in the thymus gland. In view of the embryology of the glands and remembering that thymus tissue has been described both in lower vertebrates and in birds and mammals as developing from a series of clefts, it is not surprising to find in human beings a number of accessory para-thyreoids, especially in relation to the thymus. The presence of these accessory para-thyreoids and their difficulty of recognition, except under the microscope, in all probability account for the variations of results that occur in the experimental sphere in connexion with para-thyreoidectomy.

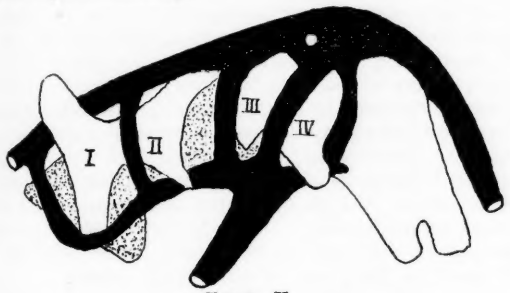

FIGURE V.
Reconstruction by Tandler, Showing Entodermal Pouches in Relation to Arterial Arches.

Secondly, with regard to the administration of extracts of the endocrinous glands, a minor war is being waged as to the efficacy of administration by the mouth. In view of the development of the thyreoid, thymus and para-thyreoid from the anterior end of the alimentary tract, it would seem rational that their secretion by passage through the stomach would not be affected by the action of the gastric juice; whilst the secretion of the other endocrine glands not connected with the alimentary tract anterior to the stomach might be adversely affected by the gastric secretion.

Part II.

The field of physiology in connexion with the endocrine glands is beset with many steep crags and full of many deep and dangerous valleys which have yet to be levelled up by the spade work of later research; but amidst these many irregularities are a few undulating plains which have been cultivated with reasonable fertility, and upon which we can tread with a reasonable amount of security. It is on these undulating plains that I propose to meander for a few moments.

The close relationship between the endocrinous glands and the autonomic nervous system is fairly well recognized. Each of these systems may be divided into two opposing sets: the thoracico-lumbar or sympathetic system being closely related

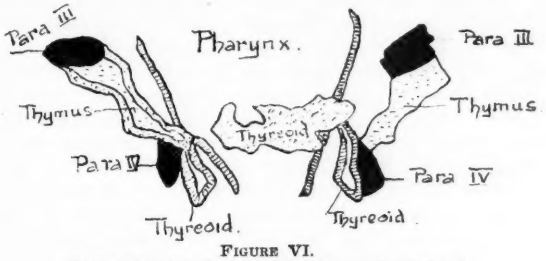

FIGURE VI.
Reconstruction (After Tourneux and Verdun), Showing Origin of Endocrine Pouches in the Neck from Entodermal Pouches.

with the thyreoid, pituitary and suprarenal glands and the cranio-sacral or para-sympathetic system associated with the para-thyreoids, pancreas and probably the thymus. Langdon Brown[2] has summed up the position as follows: "The former, the sympathetic, is katabolic, converting potential energy into kinetic and facilitating outward manifestation of that energy, while the latter, the parasympathetic, is anabolic, directing energy inwards where it is stored up, . . . when one is stimulated the other is inhibited."

Dr. Bentley[3] in a paper read before this meeting three years ago gave the results of treatment with the excitant group and expressed the intention of carrying out treatment of patients showing hyperexcitability by the depressant group. It is to record the results so far obtained by one of this group that this paper is given.

Before dealing with the clinical aspect, it would be well to have before us some of the factors on which the treatment is based. In reviewing the literature we find that four points seem to have been established with a fair degree of certainty:

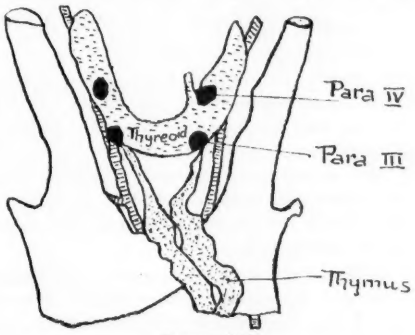

FIGURE VII.
Reconstruction (After Tourneux and Verdun), Showing Origin of Endocrine Pouches in the Neck from Entodermal Pouches.

(i.) That absence or deficiency of para-thyreoid secretion results in a syndrome characterized by the terms tetany and tetanoid; (ii.) that para-thyreoid activity is intimately connected with

calcium metabolism; (iii.) that it is an important factor in neutralizing toxic conditions of the blood; (iv.) that in leucopœnic states the administration of para-thyreoid extract increases the leucocyte blood count.

Calcium as a drug was used long before parathyreoids were even thought of, for it was not until 1880 that they were in any adequate way recognized by Sandström and even then they do not seem to have aroused the attention due to them. It was left to Gley eleven years later to re-discover them and from this time dates the history of these anatomically insignificant but physiologically important bodies. It is only within comparatively recent years that their function in relation to calcium and the blood has been worked upon and even today the story is far from complete.

It would perhaps be interesting to recall the experiments of Cavazzani and Stefani in 1882 on isolated nerve-muscle preparations. They found that the presence of univalent ionic sodium and potassium increased the excitability of nerve, while the presence of the bivalent calcium and magnesium decreased the excitability. Later it was found that sodium and potassium lowered the synaptic threshold between neurones, allowing stimuli to pass more readily, while calcium and magnesium had the opposite effect. Sabbatani has shown that the excitability of the cerebral cortex is increased by sodium and potassium ions and is diminished by calcium ions. In this connexion I may be allowed to quote from Sir James Barr's humorous address at Glasgow:[4] "If you want to think quickly, speak quickly and act quickly, you had better not have too much lime in your nervous tissue, but . . . for stability and tenacity a certain amount of lime is necessary. I sometimes think," he continues, "it might be worth while to have a typically slow, deliberate, solid Aberdonian chopped up to see how much granite is in his composition. Their salvation seems to rest in oatmeal and Scotch whisky and thus the calcium is never allowed to reach the cement stage, so you never get one who is stolid; even the ubiquitous and versatile Jew has no chance against an Aberdonian."

To Blair Bell[5] is due the credit of discovering a clinical method of estimating relatively the calcium content of the blood. Both he and Sir James Barr are careful to point out that calcium exists in the blood in two forms—a combined state in which it is united to proteid substances and in a free ionic state. By Blair Bell's method only the ionic calcium can be estimated.

In an interesting series of papers in connexion with menstrual functions Blair Bell[6] has shown that there is an increased elimination of calcium at the menstrual period and a decrease of the calcium index in the blood. And when we remember the psychical manifestations of hyper-excitability and hyper-sensitiveness that occur in a large percentage of women at the menstrual period, the relation between the deficiency of ionic calcium and the nervous phenomena is at least suggestive in its bearing on mental conditions.

It would be futile at the present day to enter into the controversy of the relations of the thyreoid and the para-thyreoid in the production of the convulsive states which are classed under the terms tetany and tetanoid. It is almost universally recognized that the operation of para-thyreoidectomy produces tetany, the variations in the severity of which depend on the number of para-thyreoids removed and on the presence of accessory parathyreoid tissue. But the relations of the parathyreoids to other convulsive states such as eclampsia, spasmophilia and other nervous conditions and their relation to the calcium content of the blood are extremely interesting.

In 1906 Vassale[7] put forward the hypothesis of para-thyreoid insufficiency in gravid women showing eclamptic seizures, based on three points: (i.) pathological changes in the para-thyreoids in the majority of women who died from eclampsia, (ii.) the beneficial results of treatment by parathyreoid extract, (iii.) experimental evidence by Erdheim, Thaler and others, confirmed by himself. In gravid bitches he performed partial parathyreoidectomy near the end of term and found that convulsions ensued which could be controlled by administration of para-thyreoid extract and that pregnancy terminated normally. In one instance the three pups died from lack of milk on the part of the mother. In another in which there were six pups, convulsions occurred during lactation, but were controlled by para-thyreoid administration. The more recent experiments offer some explanation of these phenomena. Blair Bell has shown that during pregnancy and lactation the calcium index of the blood is high to supply the demands of the offspring, while Grove's and Vines's[8] work proves that deficiency of para-thyreoid tissue causes a decrease in the ionic calcium of the blood.

Yanase[9] in 1907 applied the term spasmophilia to include a variety of conditions ranging from latent tetany, laryngo- and carpopedal-spasm to fully developed convulsive seizures of the eclamptic type. One of the tests for this condition he describes as an increased excitability of nerve to galvanic stimulation. In eighty-nine patients examined *post mortem* he found hæmorrhages in the para-thyreoids in 37%. He considers that the hæmorrhages occur at or shortly after birth and in all patients under one year he found lesions of the para-thyreoids. In a series of fifty children over one year he found thirteen showing normal reaction to galvanic stimulation, in all of which the para-thyreoids were normal; eighteen, showing hyper-excitability to galvanism, had deposits of iron pigment in the parathyreoids which he took to indicate old hæmorrhagic lesions; in the other nineteen instances, showing increase to galvanism, hæmorrhages were present in the para-thyreoids. Recent researches have shown that in all cases of spasmophilia[10] there is a deficiency of calcium in the central nervous system and in the blood. The results of treatment by parathyreoid or calcium have not, however, shown the uniformity that might be expected.

The recent work of Grove and Vines[11] and the rational lines of their treatment of chronic toxic

states are sufficiently interesting to allow a brief summary of their work. Chronicity of disease is manifested by an approximate balance between the katabolic effects of toxic states, whether bacterial or not, and the anabolic resistance on the part of the body tissues. In acute toxic states the manifestations of fever, tachycardia, shivering and perspiration, restlessness and in hyper-pyrexia convulsions can be translated in terms of a sympathetic stimulation leading to the katabolism of tissue and an increase of toxic products. The aim of general treatment in such conditions is in the direction of control of the sympathetic, lowering the fever, slowing and strengthening of the heart, enforced rest—in other words prevention of destruction of tissue—with encouragement of the anabolic process (or para-sympathetic system) by nourishing diet and elimination of the toxic products. The chronic toxic state Vines[12] considers to be of a similar nature, but of a much milder form, in which "a low grade sympathetic over-action is present," and "a simultaneous depression of para-sympathetic," evidence of which is seen in the deficiency of the calcium content of the blood, indicating a disturbance of the normal balance between the opposing sets of endocrinous glands. It is to re-establish this disturbed equilibrium that Vines aims in treatment by para-thyreoid substance. In cases of indolent varicose ulcers, Grove and Vines have recorded a marked deficiency of the ionic calcium and usually also a deficiency of total calcium. These ulcers, mostly of long standing and resistant to ordinary methods of treatment, they found responded well to para-thyreoid treatment, the activity of the healing process varying with the increase of ionic calcium in the blood. At the same time the combined calcium was decreased and the polymorpho-nuclear leucocyte blood count was increased. Applying the same treatment to other chronic conditions Grove and Vines obtained equally encouraging results. So varied are the diseases they treat, that it would almost seem as though para-thyreoid was a panacea for all ills. But the observers are careful to point out the underlying features of these diverse conditions, *videlicet*, they are chronic toxic states. In both acute and chronic toxæmias a definite diminution of ionic calcium was found, due they believe to two reasons: (i.) The circulating toxins have an injurious effect on the para-thyreoids, (ii.) the toxins probably combine with part of the calcium in the blood. A vicious circle is thus established. The toxic agents may be supposed to affect the para-thyreoids and combine with part of the ionic calcium. The calcium balance is thus disturbed and the damaged para-thyreoids are unable to readjust it, the diminished calcium resulting in a lowering of the vitality of the tissues and leading to a relative increase of toxic products. The aim of treatment then is to break this vicious circle by administration of para-thyreoid substance. The detoxicating action of para-thyreoid substance is not specific against any one toxin, but is based on its physiological action, restoring the equilibrium between the anabolic and katabolic processes of the para-sympathetic and sympathetic systems respectively, allowing the tissues to perform their natural function of repair and coincident with this is a rise in the ionic calcium content of the blood and an increase in the leucocyte count.

The resemblance of agitated melancholia to *paralysis agitans* has been recognized by more than one author. The general attitude of flexion, the feeling of misery and helplessness and the agitated movements of the smaller joints, together with the mental symptoms, are sufficiently striking to allow a comparison of these diseases. The cause of *paralysis agitans* has been variously ascribed to: (i.) The lesions of the brain in the region of the lenticular nucleus; (ii.) arterio-sclerotic changes; (iii.) deficiency of para-thyreoid secretion; (iv.) chronic toxæmia. That a vicious cycle is established leading to progressive degenerative changes seems certain. Berkeley's treatment of *paralysis agitans* by para-thyreoid substance,[13] in the light of the work of Grove and Vines seems to be an attempt to break this vicious circle and arrest, if not cure, the progressive nature of the disease. Berkeley does not claim cure, but reports that in 60% to 70% of patients who have given para-thyreoid substance a trial for three to six months, the progressive nature of the disease is arrested, usually with amelioration of the distressing symptoms to such an extent that they are able to go about their ordinary business in comparative comfort. In some cases definite cures have been established.

It needs but a short connexion with mental work to appreciate the chronic nature of a great majority of mental conditions, leading to a progressive deterioration of the mental capacity. And concomitant with this chronicity there is noticeable the chronic nature of the physical diseases with which mental patients are affected. Such chronic toxic states must have a deleterious effect on the mental condition. In how far they are the cause of insanity is a matter yet open to conjecture, but the researches of Ford Robertson[14] and others and the fact that mental states occur in the course of many severe toxæmias, lead me to the conclusion that, superimposed on an unstable mental make-up, they may at least be "the straw that breaks the camel's back" and pass a person across the thin line that separates sanity from insanity; the vicious circle, thus commenced, leads to a progressive deterioration of the personality.

In choosing our patients for treatment by para-thyreoid substance we have not stuck to one type of mental disease. But the cases reported herewith show one common feature, namely hyper-excitability, whether it be of a maniacal or melancholic type. The treatment is based on the following grounds: (i.) Para-thyreoid substance increases the ionic calcium in the blood, the depressent effect of calcium on the nervous system being well established; (ii.) para-thyreoid substance has a detoxicant effect which is non-specific and tends to break the vicious circle set up by chronic toxic states: (iii.) an attempt is made to re-establish the sympathetic-para-sympathetic balance, evidence of disturbance of which is seen in the hyper-excitability and other general symptoms.

Case Reports.

CASE I.—P.J.S., aged fifty-one years, was admitted on September 17, 1921, in a straight jacket. He had delusions of a religious character and hallucinations of an auditory and visual nature. He was threatening, destructive and mischievous and extremely restless. In November, 1921, thrombosis of right popliteal vein with swelling of foot and leg occurred and he became so restless that it was impossible to keep him in bed. In February, 1922, he developed an ulcer on the right leg which resisted ordinary methods of treatment. Four months later it measured 4.3 by 2.5 centimetres (one and three-quarter inches by one inch) and was gradually deepening. He was given para-thyreoid extract and calcium. A week later signs of healing became evident, but the process was slow. Eight months later the ulcer was completely healed. At the same time his mental condition improved; he became less restless and four months after starting to take para-thyreoid extract he began to appreciate the fact that he had been ill. In February, 1923, he was placed on the detached list and has been working with the gardener for some months past. Though somewhat childish in manner, he is considered sufficiently well to permit of discharge.

CASE II.—K.S.M., aged twenty-four years, was admitted on December 12, 1918. She suffered from delusions of persecution, was very timid and frightened that someone would do her bodily harm; was disorientated; was very restless and would not stay in bed. She became dull, stupid and confused, dirty in habits and later stuporose, in which condition she continued for four months. She was given thyreoid extract in September, 1919. She became brighter, clean in habits, answered questions and improved in general health. On thyreoid extract she became over-active, violent, destructive and abusive. The thyreoid extract was discontinued, but for eighteen months she remained the terror of the institution, until given para-thyreoid extract in October, 1921. She gradually became quieter and more rational and seven months later (May, 1922) became somewhat depressed. She was given small doses of "Hormotone" containing much less thyreoid extract than before. Four months later she was allowed out on leave to her people and has remained well since.

I quote this case to show how the conduct of the patient can be influenced by glandular preparations of the opposing sets and how by proper adjustment it may be possible to restore the normal balance.

CASE III.—A.L., aged twenty-one years, was re-admitted on September 29, 1920. She was noisy and violent, very resistive, attacked and bit a nurse, refused to speak, refused food and was tube fed. At times she was very troublesome and acutely maniacal, breaking windows and causing severe injuries to herself. At other times she was depressed and sullen, threatened suicide and attempted to do so by strangulation. In February, 1923, she developed definite auditory hallucinations. In July, 1923, she was so troublesome as to require restraint. At this time she was given para-thyreoid extract. In September she was considerably quieter, employed herself in the wards and in October was sufficiently well to be allowed on leave for the day with a nurse. At Christmas time she was allowed out for a few days under care of her mother. At present she keeps herself tidy, is no longer troublesome or destructive, is helpful in wards and has not lately threatened suicide. She is, however, still a little sullen and does not readily enter into conversation. She still has auditory hallucinations, but does not seem to pay much attention to them. She has been comparatively well for five months.

CASE IV.—L.W., aged forty-one years, was re-admitted on December 6, 1919. She is of the manic-depressive type. During maniacal periods she has been exceedingly troublesome, these periods have been followed by periods of depression in which she is sullen and will not converse. During the normal intervals between attacks she is a good worker and is allowed to go home. On January 23, 1924, she again became over active, extremely talkative, quick in movements and abusive towards the staff. After a week of over-activity it was decided to try the effect of para-thyreoid extract. Within four days she gradually became quieter, less talkative and more normal in conversation and two days later was sufficiently well to be allowed out for two days. On return she still remained normal and showed no depressed stage. She has been on leave since February 20, 1924.

Treatment of a new series of patients showing maniacal features was commenced towards the end of January this year. They have not progressed sufficiently as yet to record in detail. But the improvement that has been noticed in many patients has been sufficiently encouraging to continue the treatment. Agitated forms of melancholia in view of their similarity to *paralysis agitans* are also on treatment with but slight improvement, but on Berkeley's results of prolonged treatment we have not given up hope of future results.[1]

Two cases of the hysterical type are sufficiently interesting to record.

CASE V.—E.K., aged forty-seven years, was admitted on August 8, 1923. Before admission she had hysterical attacks during the past four years. She complained of congestive feelings in the back of her head with burning sensations working up her spine from her legs. She has what she calls "fainting" attacks, becomes very depressed and emotional and refuses food. After a typical hysterical fit she was put on para-thyreoid extract on February 12, 1924. Since that date she has had no hysterical turns, has been taking her food well and is more contented. She says she has not felt so well for many years.

CASE VI.—J.H., aged thirty years, was admitted on March 3, 1922. She says she did not talk or walk until four years of age. She has the appearance of a girl eighteen to twenty years; she is of an hysterical type, becomes exceedingly troublesome for periods of a month or more, threatens and has attempted to injure herself and has on several occasions been placed in restraint. On February 11, 1924, one of her over-active periods commenced and she was put in restraint. On February 15, 1924, she was given para-thyreoid extract and three days later she had returned to normal. In all she was over active only seven days compared with her usual period of several weeks. She has remained well since.

Conclusion.

I regret that up to the present I have not had the opportunity of carrying out clinical estimations of the calcium index of the blood in these patients, but I hope to be able to do so in the near future. The number of cases as yet is too small to draw any definite conclusion, but the results at least give encouragement to continue investigation.

Acknowledgments.

In conclusion I desire to thank Dr. Bentley for the assistance which he has given me in collecting the literature on the subject and for the valuable suggestions and information about patients who were under his care.

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BLOOD TRANSFUSION: ITS TECHNIQUE AND SOME EFFECTS IN DISEASE.[1]

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DURING the last five years I have been interested in the effects of the transfusion of blood in cases of severe hæmorrhage and in various pathological conditions resulting in excessive loss of blood or blood destruction. Many communications on this subject have been made since the stimulus given to the practice of transfusion in the great war. I will not attempt, therefore, to elaborate the history of transfusion other than to remind you that the procedure was first attempted a little over four hundred years ago. During the last two centuries many attempts have been made to discover a safe technique, the operation waxing and waning in popularity. It was, however, in the early years of the present century that the work of Landsteiner, Jansky and Shattock gave a new stimulus to the possibility of attaining success. In 1901 Landsteiner classified blood according to its agglutinating properties. In 1910 Moss repeated Landsteiner's experiments and confirmed them. He found, however, that Landsteiner's original three group classification was insufficient and enunciated a four group classification. In the light of present knowledge it is probable that there are more groups or variations of blood from the point of view of their agglutinin content than Moss's four groups.

Moss's four-class group is still adhered to and is suitable for practical purposes. Von Dungern and Hirschfeld[1] elaborated Moss's assumption that the blood cells of his groups possessed three distinct agglutinogens, each of which reacted with a specific agglutinin in the serum of another group, by enunciating the view now known as Landsteiner's law of iso-agglutinins, *id est* that in human blood there exist two types of agglutinable substances, *a* and *b*, and two agglutinins, *A* and *B*, but that any one blood does not contain one of the agglutinable substances and its complementary agglutinin. This view explains the incompatibility of blood and therefore the reason of earlier failures. The following diagram shows the supposed arrangement of these factors.

[1] Read at a meeting of the South Australian Branch of the British Medical Association on March 14, 1924.

DIAGRAM I.

Serum.	Corpuscles.			Serum.	Corpuscles.			
	A	B	C		1	2	3	4
Serum A ..		+		Serum 1 ..				
Serum B ..	+			Serum 2 ..	+		+	
Serum C ..	+	+		Serum 3 ..	+	+		
				Serum 4 ..	+	+	+	
Landsteiner's Three Group Classification.				Moss's Four Group Classification.				

+ = Agglutination of Corpuscles.

DIAGRAM II.

Incompatible Donor.			Universal. Donor.
a	*A*	*a*	*A*
b	*b*	*B*	*B*
Group I.	II.	III.	IV.

a, *b* = Agglutinable substances.
A, *B* = Agglutinins.
Landsteiner's Law of Iso-agglutinins (Modified).
(After Hirschfeld.)

Now it is believed that incompatibility is at a maximum when the corpuscles of the donor are agglutinated by the serum of the recipient. The agglutination of the recipient's corpuscles by the serum of the donor leads to no known untoward effect, probably because of the rapid dilution of the transfused blood. It will be seen, therefore, from Diagram II. that Group IV. possesses no agglutinable substance and therefore may be given to any recipient of its own group or other groups. For this reason a person of Group IV. is called a universal donor.

Group I., possessing no specific agglutinin, is a universal recipient. Groups II. and III. can only be used as donors for corresponding recipients.

Parallel with the question of agglutinin and agglutinable substances in the blood, such as erythrocytes, is that of hæmolysis. For practical purposes it can be said that where the serum of one blood will agglutinate the red corpuscles of another, so also will it hæmolyse them. Further, whether incompatibility consists entirely of agglutination and hæmolysis, or whether there are other unrecog-

nized qualities of blood which play a part in the untoward events following transfusion of incompatible blood, is not known. The agglutination and hæmolysis, however, is a practical method of recognizing the incompatibility. The question finds a parallel in the condition of uræmia in which, although the investigation involves chiefly an estimation of the blood urea, we know that the urea percentage is only an indication of the presence of other unrecognized toxic substances which are the real cause of the uræmia. It is necessary, therefore, if possible and if there is time, to carry out blood grouping, to use a compatible blood.

Blood Grouping.

The method of blood grouping I have adopted is as follows: Place three drops of a 3% solution of sodium citrate in an agglutinating tube. Prick the thumb of the donor and allow the blood to drop into the tube of citrate until there is about an equal quantity of blood and citrate solution. Take a microscopic slide and with a pipette place two drops of Group II. and Group III. serum at either end. Then add an equal quantity of the donor's citrated blood, diluted with an equal quantity of normal saline solution, to each of the sera. Rock the slide slowly. Repeat this procedure using the recipient's blood. It will be possible to group each blood at the end of five minutes. If agglutination occurs with the Group II. serum only, the blood concerned belongs to Group III. If agglutination occurs with Group III. serum, the blood is Group II.; if agglutination does not occur with either Group II. or III. serum, the blood used is in Group IV. If it occurs in both the blood is Group I.

A word of warning is due here. It is permissible to transfuse a Group IV. patient with Group II. blood, the incompatibility being only partial. Complete incompatibility, however, is apt to develope in these circumstances as a result of multiple transfusions from the same donor. The same donor, therefore, should not be used if the transfusion is repeated. It appears that the introduction of Group II. blood into a Group IV. donor, induces an increased hæmagglutinin content in the blood of the recipient and makes subsequent transfusions from the same donor dangerous. This reaction resembles very closely the condition of anaphylaxis.

Incompatibility.

The manifestations of incompatibility are as follows: If incompatible blood is introduced, the red cells of the donor's blood are agglutinated and hæmolysed by the serum of the recipient. This takes place immediately and the effects of agglutination are immediately manifested (owing to the blocking of the pulmonic capillary circulation) by a sense of suffocation, pallor, dyspnœa and substernal or epigastric pain. If incompatibility is complete, death is likely to take place within five minutes or before the introduction of more than one hundred cubic centimetres and it will be preceded by loss of consciousness, stertor and cyanosis with spasm. Hæmolysis shows itself in a rigor within half an hour, pyrexia for a short period, urticarial eruptions, moderate collapse, jaundice at the end of twenty-four hours with the passing of hæmoglobin in the urine. These symptoms (excepting the jaundice) usually disappear at the end of twenty-four hours, the jaundice subsiding in three to four days. As soon as incompatibility is recognized the transfusion should be stopped. However, if the manifestations are slight, it can be commenced again in a few minutes and the blood should be introduced very slowly. In cases of slight incompatibility the symptoms usually pass off and the patient will probably show some manifestations of moderate hæmolysis.

I have found that even when specimens of blood are of the same group it is not infrequent to get a moderate degree of incompatibility with a slight shiver, some hæmoglobinuria and tingling in the skin during transfusion.

Dangers of Transfusion.

Apart from the question of incompatible blood there are a number of dangers associated with transfusion. With careful management and proper technique these can be avoided.

The Introduction of Air and Clots as Emboli.

With the introduction of air and clots as emboli cyanosis and dyspnœa occur. The pulse becomes rapid and weak and death may follow. These accidents can be avoided with proper control of the vein and by using a needle or nozzle of small calibre.

Acute Dilatation of the Heart.

Acute dilatation of the heart may occur in old people with arterio-sclerosis and in patients with extreme anæmia with myocardial impairment. It is wise in such cases not to give more than four hundred cubic centimetres of blood and to introduce it very slowly.

Transmission of Infection.

Instances have occurred in which pyogenic infection has been transmitted to the donor. It is needless to say that this is due to faulty surgical technique. The operator must beware not to touch the donor with any instrument or glove which has been in contact with the recipient, and to keep the instruments required in the two venesections from being mixed or from coming into contact.

Syphilis may be transmitted. If the donor is a near relative a careful questioning as to the history may suffice. It is wise, however, if practicable, to have the Wassermann test done on the donor. Other infections, such as malaria, may possibly be transmitted.

Apparatus and Technique.

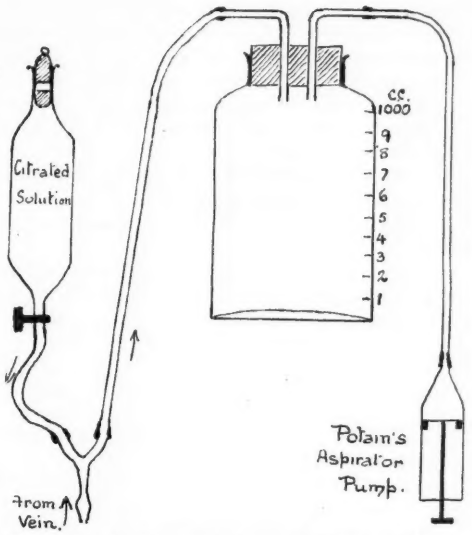
Having obtained a suitable donor the skin of the antecubital fossæ of the chosen arms of the donor and recipient are carefully cleansed and a spirit dressing applied. It is best to have both subjects as near each other as possible and preferably in the same room. However, if this is not possible they may be placed in separate rooms. It is wise, also, to inspect carefully the veins of donor and recipient before commencing the transfusion so that a needle

or nozzle of suitable size can be affixed to the apparatus. Five minutes before commencing tie a bandage round the chosen arm of the donor above the elbow without compressing the arterial circulation, allow the arm to hang down and wrap a hot towel round the forearm and cover it with jacinet. It is remarkable how this manœuvre will increase the "bed" of blood in the forearm and the rate of flow and therefore reduce the time occupied in taking the blood. Finally, when you are ready to commence, place the arms of donor and recipient on a board which is supported by their weight at the shoulders. You may use one board for both subjects or a board for either. Having placed sterile towels in position you are ready to commence.

I have used citrated blood. Although the use of citrated blood is open to the objection that blood pressure is depressed, I believe the objection is mainly theoretical. Further I think the method carries less risk to the recipient. There is no likelihood of clotting and subsequent waste of blood and this is an important factor where donors are difficult to obtain. To prepare the citrated solution nine grammes of pure sodium citrate are dissolved in three hundred cubic centimetres of freshly prepared normal saline solution and the solution is filtered into a small flask and autoclaved or boiled. This quantity gives you enough citrate to run in with the blood and a larger quantity in which to rinse your apparatus. I use about fifty cubic centimetres of the citrated saline solution to every four hundred and fifty cubic centimetres of blood or approximately these quantites. The quantity of actual sodium citrate introduced is therefore one and a half to three grammes. The flask of citrate should be placed in a bowl of water heated to 43.3° C. (110° F.).

The apparatus consists of a slightly modified Robertson's bottle with attached exhaust pump. The modification which I have employed, consists in the use of a Y tube which permits the introduction of the citrate solution at the point of exit from the vein. In some cases, previously to the use of this device, I found it necessary to stop the blood-letting for some reason and re-insert the cannula. During the interval the blood in the tube coagulated. The admission of the citrate with the blood near the exit from the vein prevents any clotting and makes the procedure very simple and sure. One arm of the Y tube is inserted into the vein, the other arm leads the citrate solution from a hundred cubic centimetre flask which is controlled by a tap, and the third arm leads to the collecting bottle. The flow of citrate solution can be regulated easily at the tap or the stopper of the citrate containing flask. The blood is led by a rubber tube into the graduated bottle. A negative pressure is obtained in the bottle by the use of the exhaust pump. A Potain's aspirator pump or a Higginson syringe make a a very suitable exhausting apparatus. The blood-collecting bottle and the citrate flask are held in a metal frame and can be easily handled.

Two sets of intravenous instruments are required. These should be parcelled separately. Each set consists of scalpel, tissue forceps, two Spencer Wells forceps, two mosquito forceps, aneurysm needle, skin needle and suture material. The apparatus and parcels of instruments are sterilized in the autoclave or by boiling.



Diagrammatic Representation of Apparatus Used in Blood Transfusion by the Citrate Method.

Having inspected the apparatus, making sure that the tubes are not blocked and trying-out the pump, the donor and recipient are placed in position and the fields of operation protected with sterile towels. Infiltrate the epidermis over the chosen vein with Barker's solution. Then place the blade of the scalpel over the vein and with the thumb of the left hand slide the skin to one or other side. Then make an incision two centimetres long through the skin into the subcutaneous tissue. You will find that on permitting the skin to recoil into position the vein is exposed and protrudes into the incision. Carefully clean the vein of the loose areolar tissue surrounding it and separate it for a distance of one centimetre. Ligate the vein proximally in the case of the donor and distally for recipient. Place a second ligature round the vein and tie a simple loose knot. Hold the ends with a pair of Spencer Wells forceps. Keep this ligature pulled fairly tightly so as to kink the vein. Pick up the vein at its margins with mosquito forceps and incise it longitudinally. If the loose ligature is kept taut and the vein kinked, there will be no escape of blood after incising the vein. Next pick up the cut edges of the vein with the mosquito forceps (removing them from the margins of the vein for this purpose) and inspect the incision in the vein to make sure that the intima is clearly seen. (In the donor the second loose ligature is held below the incision in the vein and in the recipient above it.) The above procedure is followed in the case of donor and recipient.

To obtain the blood from the donor gently insert the cannula into the incision in the vein, at the same time relaxing the kink and tie the cannula into the vein. The blood will run into the bottle. Regulate immediately the flow of citrate and get

the donor periodically to make a "fist" so as to keep up the flow of blood. If the flow of blood is reduced loosen the bandage round the arm for a minute or two and then retie it. When sufficient blood has been obtained, remove the cannula, ligate the vein, suture the incision and remove the tube with the cork from the bottle.

During the time occupied in exposing in a similar manner the vein of the recipient keep the bottle of blood gently agitated in a bowl of water heated to blood heat.

In order to introduce the blood I use simply a funnel and tubing, running the blood in slowly until all question of incompatibility is excluded and then accelerating the flow. Carefully observe the recipient during the transfusion. I like to use a small cannula to run the blood into the recipient's vein. It prevents the blood from running in too rapidly and filters off any small embolus or foreign body which may have got into the blood.

I have, no doubt, described details with which you are quite familiar. My reason, however, for giving the details of this very simple surgical procedure lies in the fact that one or two of the details such as the kinking of the veins greatly increase the ease and reduce the time of the operation.

TABLE I.

SUMMARY OF THE RESULTS OF THIRTY-THREE CASES OF BLOOD TRANSFUSION.

Disease.	No. of Cases.	Recovery.	Result Improvement.	No Improvement.
Pernicious anæmia	3	..	1	2D
Splenic anæmia	2	1	..	1D
Abdominal tuberculosis with profound anæmia resembling aplastic anæmia	2	..	1	1D
Hæmophilia with hæmorrhage	5	5	..	..
Secondary anæmia, ovarian cyst	1	..	1	..
Hydatid of liver	1	..	..	1D
Malignant deposits in spine, secondary anæmia	1	..	..	1D
Streptothricosis, secondary anæmia	1	..	..	1D
Gastric or duodenal ulcer, hæmatemesis	3	3	..	..
Obstetric Conditions—				
Miscarriage	2	1		1D
Ante-partum and *post-partum* hæmorrhage	1	1	..	..
Hæmophilia and labour	1	..	..	1D
Albuminuria, *post-partum* hæmorrhage	1	1	..	..
Ectopic gestation	2	1	..	1D
Traumatic Hæmorrhage—				
Compound fracture	4	2	..	2D
Rupture of spleen	1	..	..	1D
Cholecystitis, post-operative hæmorrhage	1	1	..	..
Tonsillectomy, congenital heart disease, hæmorrhage	1	1	..	..
	33	17	3	13D

D = Death.

INTERPRETATION.—The recovery of the obstetric and traumatic patients was complete. In the other cases recovery means the recovery from the immediate condition of hæmorrhage. In the case of splenic anæmia subsequent splenectomy was performed, the transfusion being done in order to permit this. As far as can be ascertained the patients with hæmophilia have had no subsequent hæmorrhage.

Notes of Cases.

Abdominal Tuberculosis, Profound Anæmia, Repeated Transfusions.

CASE I.—A.T., female, aged twenty-two years, single, was admitted to hospital in June, 1922, with severe anæmia and abdominal pain situated about the umbilicus. The onset had been gradual and the illness had been progressing for eight months. The blood picture was that of an anæmia in most respects resembling aplastic anæmia, but the presence of some nucleated cells made the diagnosis obscure. The first transfusion was carried out three days after admission with a definite temporary improvement in the red cell count and the hæmoglobin percentage. There was also evidence of a bone marrow reaction as shown by the presence of many nucleated forms. The blood condition, however, relapsed and two months later, despite "Soamin" medication, showed the same condition as on admission. In September, 1923, following attacks of abdominal pain with diarrhœa and distension the diagnosis of abdominal tuberculosis was made and a posterior colpotomy performed with temporary relief. In October, 1923, treatment by Dreyer's vaccine was carried out. She subsequently developed pleurisy with effusion, the abdomen became very distended with fluid, the urine was found to contain albumin, blood and granular and epithelial casts. In February, 1924, there was a purpuric rash on the arms, the gums oozed blood and the general condition was very bad. Three transfusions at weekly intervals were then carried out with a resultant improvement in the blood and the general condition. Table II. shows the blood findings during her illness.

Post-Partum and Ante-Partum Hæmorrhage, the Length of Life of Transfused Corpuscles.

CASE II.—Mrs. K.M.W., aged twenty-three years, *multipara*, was admitted to the Queen's Home on January 8, 1924. She had been nearly two days in labour and was bleeding when admitted. She had bled very freely before admission and stated that the blood had soaked through the mattress on to the floor. Her pulse was weak and very rapid, the skin was clammy and she was vomiting freely. After having been fifty-five hours in labour she was delivered of male twins under ether anæsthesia by footling delivery after rotation from transverse positions. She lost more blood during delivery. After delivery the condition was slightly improved. On January 10 her condition was much worse. The pulse was one hundred and twenty-eight per minute, her colour was white. There was restlessness and air hunger. She was transfused with one thousand cubic centimetres of citrated blood from the husband with immediate and marked improvement. Apart from a slight rigor one hour after transfusion, she had an uneventful recovery and was discharged well on the eighteenth day. In this case blood examinations were carried out with the object of determining the life of the transfused corpuscles. Ashby[2] has stated that the erythrocytes live and function for a period of twenty-four to thirty-six days and that the existence of transfused corpuscles can be demonstrated in cases where the donor and recipient are in different groups. (In this case the recipient was Group II. and the donor Group IV.) If the blood of such a patient after transfusion is mixed with Group IV. serum, the cells of the patient are agglutinated whilst the introduced cells are not agglutinated. As these latter cells disappear from the circulation, the number of unagglutinated cells gradually diminishes until none of the transfused corpuscles exist in the blood. Ashby carried out control experiments and found that the average number of unagglutinated corpuscles, where such a test was carried out on a patient without previous transfusion, varied from 0.3% to 3.4% of the red blood count. The *modus operandi* is as follows: The red cells of the transfused patient are counted. Then blood is taken from the ear in a white cell pipette to the 0.5 mark, the pipette is then filled to II. mark with an agglutinating serum (usually Group IV.) to which a 4.4% solution of sodium citrate has been added in the proportion of twenty of serum to one of citrate solution. This gives a one in twenty-two mixture of blood and citrated serum. The mixture is incubated at 37° C. for forty minutes with frequent shaking and then left in the ice box for twenty hours. The mixture is then shaken and the unagglutinated cells counted in a hæmocytometer. In this case the blood was examined weekly, commencing twenty days after transfusion and the examination was carried out twice for

TABLE II.

Date.	Red Blood Corpuscles per Cubic Millimetre.	Hæmoglobin Percentage.	Colour Index.	White Blood Corpuscles per Cubic Millimetre.	Differential Count.		Abnormal Cells.
					Polymorphonuclear Leucocytes Percentage.	Lymphocytes Percentage.	
7/ 6/1923..	1,740,000	29	0.7	7,500	49	42	Megalocytes, few normoblasts
9/ 6/1923[1].	..	..	..	..	..	..	
10/ 6/1923..	3,120,000	57	0.9	5,500	..	..	Many nucleated forms
13/ 6/1923..	2,290,000	40	..	..	..	..	
1/ 8/1923..	2,630,000	53	0.9	3,600	17.5	72	Megalocytes
25/ 8/1923..	1,570,000	29	0.85	12,600	75	23	Few normocytes and megalocytes
22/ 9/1923..	..	..	..	..	54	40	
9/10/1923..	2,230,000	39	..	4,400	43	54	
26/12/1923..	..	..	..	..	47	49	
27/ 1/1924..	1,660,000	27	..	5,700	..	..	
6/ 2/1924..	..	16	..	..	..	..	
14/ 2/1924..	1,500,000	22	..	..	..	..	
20/ 2/1924[2].	..	..	..	..	..	..	
20/ 2/1924..	1,800,000	48	..	3,600	18	78	
22/ 2/1924..	..	..	..	..	72	17	
24/ 2/1924..	..	..	..	..	16	66	
26/ 2/1924..	2,390,000	40	..	8,000	29	63	
27/ 2/1924[3].	..	..	..	..	..	..	
28/ 2/1924..	3,680,000	52	..	4,300	51	45	
1/ 3/1924..	3,380,000	54	..	9,000	32	62	
3/ 3/1924..	2,120,000	45	1.0	7,300	33	64	1% myelocytes
5/ 3/1924..	3,950,000	55	0.7	4,300	49	49	
7/ 3/1924..	3,450,000	55	0.8	6,800	35	57	1% myelocytes
8/ 3/1924[4].	..	..	..	..	..	..	
10/ 3/1924..	4,400,000	60	..	..	..	..	
12/ 3/1924..	4,000,000	58	..	6,500	..	..	1% myelocytes

[1] Transfusion 1 from brother A., Group IV. (600 cubic centimetres).
[2] Transfusion 2 from brother B., Group IV.
[3] Transfusion 3 from brother C., Group IV.
[4] Transfusion 4 from an uncle, Group IV.

control purposes on each of the first two examinations. The results will be found in Table III.

Albuminuria of Pregnancy. Post-Partum Hæmorrhage.

CASE III.—Mrs. B., aged twenty-five years, *primipara*, was confined on November 25, 1921. A moderate cloud of albumin had been found in the urine a week prior to her confinement. She was five hours in labour and delivery was completed with forceps. Complete laceration of the perineum occurred and was sutured. There was free immediate *post-partum* hæmorrhage and the placenta was delivered half an hour after the child was born. After the confinement the pulse was one hundred and thirty-six per minute and the temperature 38.6° C. (101.4° F.). The temperature showed an evening rise for the first week to 38.4° C. (101° F.) and on the eighth day to 40° C. (104° F.). The perineal wound suppurated. The condition became worse towards the end of the first week with repeated vomiting, marked pallor and pyrexia and a moderate œdema of the legs. The pulse rate was one hundred and forty on the evening of the eighth day. On the ninth day she was transfused with six hundred cubic centimetres of citrated blood from the husband. Improvement immediately followed. The pulse rate was normal two days later. The pyrexia gradually subsided in seven days. The condition progressively improved and she was discharged sixteen days after the transfusion.

Hæmorrhage in Duodenal Ulcer.

CASE IV.—Miss M.T., aged twenty-eight, fainted in her bath and on the following day was very pale. Three days later she collapsed and vomited blood and passed thick tarry stools. Her condition was then very bad and she had obviously lost a large amount of blood. Her skin was of a lemon yellow tint. She was transfused with six hundred and fifty cubic centimetres of blood from her brother and her colour and general condition were immediately improved.

Patient and donor belonged to Group IV. She had a slight shiver two hours after transfusion and there was a pyrexia for three days, the temperature rising to 38.9° C. (102° F.) in the evenings. She recovered. Following a discussion with Dr. Fry I found that I had used new rubber tubing on the transfusion apparatus and it had been sterilized by autoclaving. Similar reactions have been reported following the use of certain rubber tubing and it has been recommended to boil new tubing in a weak solution of soda prior to use.

TABLE III.

Date.	Erythrocyte Count per Cubic Millimetre.	0.4% of Erythrocyte Count.	Unagglutinated Erythrocytes per Cubic Millimetre.	Presumed Foreign Cells Present.
10/1/1924[1]				
30/1/1924	4,280,000	17,420	509,600	492,180
	4,330,000	17,320	508,800	491,480
6/2/1924	2,099,000	12,360	130,000	117,640
	2,600,000	9,200	138,000	128,800
13/2/1924	4,950,000	..	..	..
15/2/1924	4,620,000	18,480	18,000	..

[1] Transfusion.

NOTE.—0.4% is arrived at by assuming that 18,000 (the lowest count of unagglutinated cells) represents the unagglutinable cells of the recipient's blood. The duration of the life of the transfused corpuscles would appear to have been thirty-six days.

Severe Hæmatemesis in Gastric Ulcer.

CASE V.—A.E., male, aged twenty-seven years, was admitted on June 25, 1923. He had had two severe hæmatemeses during the day and the previous history suggested a gastric ulcer.

When admitted there was extreme pallor of skin and mucous membranes. On the same day subsequently to admission he had two further attacks of hæmatemesis and vomited a total quantity of 1,120 cubic centimetres (thirty-four ounces) of blood. The general condition was immediately precarious and he appeared to be exsanguinated (pulse one hundred and fifty per minute and thready). He was then transfused with seven hundred and fifty cubic centimetres of citrated blood and the pulse rate taken immediately after transfusion was one hundred and twenty-two per minute. The systolic pressure before transfusion was 110 and the diastolic 80 millimetres of mercury; after transfusion they were respectively 140 and 100. His general condition was much improved. He had no further hæmatemesis and made an uneventful recovery. He has not yet had any operative treatment for the ulcer. On March 8, 1924, he felt well and was doing heavy work, but still had some flatulence and discomfort after meals. The blood examination on the day following transfusion showed the following results:

Red blood cells, 4,600,000 per cubic millimetre; white blood cells, 12,250; hæmoglobin percentage, 85% and colour index, 0.8.

The film showed punctate basiphilia of some of the red cells.

Duodenal Ulcer.

CASE VI.—A.K., female, single, aged twenty-three years, was admitted to hospital on June 6, 1923. She had had severe epigastric pain for fourteen days prior to admission and two copious hæmatemeses. She was very pale and the general condition was grave. On the evening of the day of admission she had a further hæmatemesis. The next day she was *in extremis*. She was transfused with eight hundred cubic centimetres of citrated blood with immediate improvement. Incidentally she was a congenital syphilitic. The diagnosis of the cause of bleeding was duodenal ulcer. She made an uneventful recovery and was discharged on August 27, 1923.

Hæmophilia.

CASE VII.—G.T., a young man, aged twenty-two years, a hæmophilic, with a strong family history and previous severe bleeding, had a bicycle accident seven days prior to admission. He received a lacerated wound of the upper lip and bled practically continuously for seven days despite suture and active treatment.

When examined the pulse was one hundred and twenty per minute of low volume and tension. He was exceedingly pale and was treated actively with hæmostatic serum and calcium lactate for several hours without cessation of hæmorrhage. His general condition became precarious. Forty cubic centimetres of fresh blood from a Group IV. donor were injected into the subcutaneous tissue of the abdominal wall. The bleeding had practically ceased the following day, when forty cubic centimetres of blood from the same donor were injected intravenously. On the second day there was slight continuous oozing from the wound. His colour was white and the pulse one hundred and twenty-eight per minute and weak. He was transfused with eight hundred cubic centimetres of citrated blood. The colour and pulse were much improved immediately. He had a slight shiver thirty minutes after transfusion. On the third day he was much improved. There was very slight oozing occasionally.

There was no subsequent bleeding. The wound was treated by frequent cleansing with hydrogen peroxide and applying gauze soaked in the blood of the donor. Healing was complete sixteen days after admission. He made a complete recovery.

CASE VIII.—S., a small boy, aged nine years, with a very strong family history of hæmophilia, received a deep lacerated wound on the chin and bled practically continuously for seven days. He was then very exsanguinated, restless and had not slept for several nights. Suture of the wound and vigorous treatment with calcium lactate and hæmostatic serum failed to arrest the bleeding. The condition was grave. He was transfused with eight hundred cubic centimetres of citrated blood from his uncle, a hæmophilic himself. The immediate result was most striking. The pulse dropped from one hundred and fifty prior to transfusion to ninety-eight immediately afterwards, the colour was improved and the child slept. The wound was treated with gauze soaked in some of the blood of the donor and kept in a sterile bottle for this purpose. There was a slight occasional oozing for forty-eight hours. The wound on the chin and the incision were both healed at the end of a week. He made a rapid and uneventful recovery. It is my opinion that this child would certainly have died without transfusion.

Obscure Hæmorrhagic Diathesis in a Young Woman: Bone Marrow Reaction Following Transfusion.

CASE IX.—G.M.W., female, aged twenty-one years, single, was admitted on March 2, 1923. She had always bruised on slight injury and was subject to frequent and copious epistaxis. The menstrual periods were frequent, profuse and prolonged. Her feet swelled after exercise. Two years previously tonsillectomy had been performed without excessive bleeding. One of her sisters was inclined to bleed, but there was no other family taint of hæmophilia. She complained of extreme weakness and exhaustion after exercise.

On examination there was marked pallor, the pulse was one hundred and thirty-two per minute and of poor volume. There was no cardiac murmur. The pelvic organs revealed no discoverable abnormality. There was a bruise in the abdominal wall.

Two days after admission she had a fairly profuse and continuous epistaxis for several hours and this occurred again on the following day. Although her periods had ceased on March 1, 1923, she commenced to menstruate again on March 9. The following day she was exceedingly weak and the colour was almost white. The blood pressure had been progressively falling for several days. The pulse rate was one hundred and sixteen per minute. She looked exceedingly ill. On March 14 she was transfused with five hundred cubic centimetres of citrated blood from her sister. Patient and donor were Group IV. She had a slight shiver thirty minutes after transfusion and there was a sharp rise of temperature for a few hours. The blood pressure rose from 110/58 prior to transfusion to 130/72 after transfusion. The next day she was much improved. The menses had ceased. On March 19, 1923, following some failure of vision a few small retinal hæmorrhages were observed.

On March 21 she passed a firm blood cast of the uterine cavity. Her recovery was then uneventful and apparently complete with the exception of a slight epistaxis on March 24. She was discharged in good health on May 2, 1923. On subsequent examinations her health has been maintained. The summary of her blood examination is seen in Table IV.

TABLE IV.

Date.	Erythrocytes, per Cubic Millimetre.	Hæmoglobin Percentage.	Colour Index.	Leucocytes, per Cubic Millimetre.	Differential Count		Abnormal Cells.
					Polymorphonuclear Leucocyte Percentage.	Lymphocytes Percentage.	
2/3/1923..	2,660,000	43	0.71	2,250	67	33	
9/3/1923..	..	..	..	..	..	..	Few myelocytes
13/3/1923..	1,980,000	..	..	..	..	..	Coagulation time, 4½ minutes
14/3/1923[1] .	..	..	..	..	..	..	
16/3/1923..	4,800,000	..	..	9,500	52	35	Myelocytes 12%; no nucleated red cells
19/3/1923..	4,320,000	37	0.36	13,000	50	25	Myelocytes 20%
23/3/1923..	4,160,000	40	0.47	10,800	40	38	Myelocytes 16%; definite central pallor of red cells; many myelocytes; increased tendency to agglutinate
5/4/1923..	4,100,000	42	0.47	10,800	..	..	Myelocytes 13%; many megalocytes
7/4/1923..	4,160,000	37	0.42	8,600	..	..	Myelocytes 10%; anisocylosis less marked
10/4/1923..	4,320,000	37	0.39	10,200	..	..	Myelocytes 8%
6/6/1923..	4,200,000	45	0.47	4,000	..	..	No myelocytes; no nucleated red cells
10/7/1923..	4,400,000	..	..	8,000	..	..	
5/12/1923..	4,900,000	63	0.57	5,400	..	..	

[1] Transfusion 500 cubic centimetres.

In this case there was a well marked bone marrow reaction following transfusion. This reaction persisted for three months subsequent to transfusion. Further there has been practically a complete cessation of bleeding for eleven months.

Traumatic Hæmorrhage.

CASE X.—P.B., aged thirty-two years, male, was admitted on June 2, 1923. Two hours prior to admission the wheel of a heavy lorry passed over his right leg below the knee fracturing tibia and fibula and producing a severe laceration. The condition when admitted was one of extreme shock. He had lost a great deal of blood and was very pale. The pulse was almost impalpable. There was restlessness. Immediate treatment of the shock was carried out. The hæmorrhage had ceased. At 7 p.m. the condition was slightly improved and the leg was dressed and put on Thomas's splint with slight extension. At midnight he was transfused with seven hundred and fifty cubic centimetres of citrated blood. The improvement was definite and immediate. Two days after the transfusion the leg was amputated above the knee joint. The result was recovery.

Immediate or early amputation would have almost certainly been fatal. The transfusion replaced lost blood, improved shock and shortened the resuscitation period and enabled amputation to be carried out.

CASE XI.—J.C., male, aged fifty years had the left leg torn off below the knee in belting. Two days later the leg was amputated above the knee. After the operation the condition was one of severe shock and hæmorrhage. Later in the day he was transfused with six hundred cubic centimetres of citrated blood from a brother without previous blood grouping. He had a rigor one hour after operation, but the following day he was much improved and he was progressing satisfactorily until four days after transfusion when he developed pulmonary complications and died the following day. It was presumed that there had been an injury to the diaphragm and that the pneumonia was secondary to this.

Hæmorrhage After Tonsillectomy in Congenital Heart Disease.

CASE XII.—A boy, aged eight and a half years, with congenital heart disease had an operation for the removal of the tonsils on February 14, 1924. The hæmorrhage at operation was not excessive. He had a mild delayed hæmorrhage two days after operation and the bleeding ceased on removing the clots. He appeared to be recovering and felt well on February 23, except that he had a slight cough with some sputum. On March 8 he began to cough up blood and to expectorate clots. The bleeding continued until the following day when the clots were removed and he was treated with calcium lactate and the application of ice. The pulse was at this time one hundred and twenty per minute. Hæmostatic serum was administered. Later at 9 p.m. on the same day he was anæsthetized and the tonsillar fossa cleaned of clot. No definite bleeding point could be found. His condition subsequently was grave. He appeared to be exsanguinated, the pulse was one hundred and forty-four per minute. He was very restless. He was transfused at midnight with five hundred cubic centimetres of citrated blood from his father (Group IV.) with immediate improvement. At 6 a.m. his pulse was ninety. The bleeding ceased. At the present time he has a slight evening rise of temperature with cough and some sputum.

Pernicious Anæmia.

Three patients with pernicious anæmia have been transfused. In two of these the patients had reached the terminal stages and transfusion was followed by slight improvement and then a rapidly ensuing fatal issue. In the third case of moderate severity only the improvement was well marked with subsequent relapse within one month. It is my opinion that transfusion in cases of this disease should be carried out early and repeated at frequent intervals.

Acknowledgments.

I have to thank various physicians and surgeons under whose care these patients have been, for their courtesy in forwarding me clinical notes and for permission to use them in this paper.

References.

(1) Von Dungern and Hirschfeld: *Zeitschrift für Immunitätsforschung*, 1911, page 526.

(2) Ashby: *Mayo Clinic Papers*, 1919, page 621.

Reports of Cases.

AN UNUSUAL CASE OF FOREIGN BODY IN THE TRACHEA OF A YOUNG CHILD.[1]

By LIONEL D. COWLING, M.B., B.S. (Adelaide),
Resident Medical Officer, Adelaide Hospital, South Australia.

L.S., aged one and a half years, was admitted to the Adelaide Children's Hospital on November 30, 1923, with a history of having fallen down outside on a gravel path twenty-four hours before admission. When he was picked up he was choking and had great difficulty in getting his breath. This latter had continued with more or less stridor up to his admission. The severity of stridor varied at times. He had an occasional short cough without expectoration. He had vomited only when attempts had been made to feel if there was a foreign body in the pharynx. No foreign body had been felt and he had no cyanosis.

The patient was a healthy baby with a noisy respiratory stridor most marked on inspiration. There was no cyanosis of the lips. The temperature was 37.9° C. (100.2° F.), the pulse rate was one hundred and sixty and the respirations numbered thirty-six in the minute. No foreign body could be felt or seen in the throat and a general examination revealed no abnormality. On examining the lungs a percussion note equal on both sides was elicited and there were noisy rhonchi on both sides.

On inversion and shaking no foreign body could be dislodged. A radiograph was taken, but no foreign body was discovered. For the first two days there was no change in his condition, but on December 3, 1923, his breathing was much more distressed. Examination on that day showed that the percussion note was impaired and the breath sounds weaker at the right base and rhonchi were present as before. During the night his distress had been much more noticeable and he had become cyanosed.

On December 4, 1923, under general anæsthesia a tracheotomy was performed and on opening the trachea a quantity of pus escaped. A long silver wire hook, about fifteen centimetres (six inches) long was then passed down the trachea for its entire length and the foreign body which proved to be a half of a peanut was recovered. The skin was sutured with horsehair sutures. The child made an uneventful recovery, leaving hospital five days after the operation, perfectly well.

The child in this case was so small that it was found impossible to pass a bronchoscope and so the removal of the body from above could not be attempted. Resort had to be made to the method detailed.

Reviews.

ALCOHOL AND ITS ACTION.

PROHIBITIONISTS will undoubtedly be disappointed with Professor Starling's book, "The Action of Alcohol on Man", for the unqualified condemnation which they desire and probably expect, is not there.[2] On the other hand apologists for the "trade" will not find much that is serviceable

[1] Read at a meeting of the South Australian Branch of the British Medical Association on March 14, 1924.

[2] "The Action of Alcohol on Man," by Ernest H. Starling, C.M.G., M.D., Sc.D., F.R.C.P., F.R.S., with Essays by Robert Hutchinson, M.D., F.R.C.P., Sir Frederick W. Mott, K.B.E., M.D., F.R.S., LL.D., F.R.C.P., and Raymond Pearl, Ph.D.; 1923. London: Longmans, Green and Company; Demy 8vo., pp. 300. Price: 12s. 6d. net.

to them except such guarded statements as: "In moderation it is difficult to appreciate any harmful effects from its use".

The book is a calm, balanced exposition of the problem by a master physiologist. It is written for the lay public but the medical man would do well to give the book a careful reading, for it is not in Professor Starling's power to write a popular work without illuminating it with flashes of unexpected original treatment and profound scholarship. A simple and lucid account is given of the elementary physiology of digestion, absorption, circulation, respiration, metabolism, body temperature and the central nervous system sufficient to enable the lay reader to understand the various actions of alcohol on the body. There are some interesting appendices. Dr. Robert Hutchison contributes a brief essay on alcohol as a medicine; Sir Frederick Mott devotes about thirty pages to alcohol in its relation to mental disorders; whilst Profesor Raymond Pearl, of the Johns Hopkins University, gives over double this space to a careful statistical inquiry into alcohol and mortality. The outcome of the inquiry is as follows:

(i.) Alcohol is oxidized in the body and can be regarded as a food. In our opinion too much space is allotted to proving this contention for the food aspect of alcohol affects a few diabetics and elderly folk only. Of those who consume alcohol 99% take it for its drug action and not for its calories. Professor Starling himself admits—"for the normal individual the food value of alcohol is not of importance."

(ii.) The action of alcohol is depressive and not stimulating. By the removal of restraints and checks alcohol may appear to be a stimulant. Towards this conclusion all recent pharmacological work has certainly been pointing.

(iii.) Alcohol plays a relatively unimportant part in the production of certified insanity (Sir Frederick Mott).

(iv.) Alcohol in certain disordered conditions of the body can act as a useful drug (Dr. Hutchinson).

(v.) Whilst the excessive use of alcohol diminishes the mean duration of life and increases rate of mortality, the moderate use of alcohol does not do so (Professor Pearl).

(vi.) Physiologically, medically, ethically, the excessive use of alcohol is to be whole-heartedly condemned. The moderate use of alcohol is not harmful; whilst physiologically it cannot actually be condemned, it brightens life and fosters community feelings.

One aspect of the problem omitted from this discussion is the artistic element in wine. To those who can afford it, there is a palatal gratification which is strongly associated with the æsthetic. Mr. Wells has said that he cannot anticipate a time when high-class wine will be forbidden. Many will agree with him.

One feature of the book that should not be deprived of mention is the good index.

THE STUDY OF PSYCHIATRY.

THE second edition of an "Introduction to the Study of Mental Disorders" by Dr. Francis M. Barnes, Junior, is compiled for the assistance of students commencing the study of psychiatry, but there is much in it to intrigue the interest of the experienced in this branch of medicine.[1] Part I. is allotted to what may be termed medical psychology, and Part II. deals with the different types of mental diseases. In the opening chapter of Part I. there is a description of man's attitude towards insanity from the time of earliest history up till the present date. This is divided into several periods. From primitive man up to the time of Hippocrates constitutes the first period. During this period insanity was regarded with superstition and everything associated with it was the business of the priests of the religious belief prevailing at the time. From then onwards the ideas changed according to the progress of civilization until the present time in which humanitarianism and the combined clinical, anatomical and psychological study of insanity are the order of the day.

The author agrees with the idea that upon the integrity of the brain cells depends the sanity of the individual, but considers that certain symptoms of insanity such as hallucinations and delusions are efforts of the patient's Psyche to secure peace of mind by creating a false environment when the patient is unable to stand up to the difficulties met with in the strife of life.

A disappointing feature of the book is that the references are chiefly to German and Continental writers and practically no reference is made to British authorities who have contributed so largely to the present day enlightenment. The author shows an ignorance of Sir Frederick Mott's work when on page 59 he refers to "the so-called functional disorders such as *dementia precox* and hysteria."

As is usual in every book on the subject of psychology there are a new terminology and arrangement which add to the confusion of beginners, but in Dr. Barnes' book the explanations of the different psychic processes are clearly made.

In the chapter on history taking much could be left out. Surely it is not necessary to caution against asking a patient where his father lives when he has just said that his father is not living Again, is it advisable to put leading questions to a patient such as: "Did anyone use electric batteries on you?"

In the discussion of the different varieties of mental diseases there is this reference to the relationship between syphilis and insanity: "We may agree with Ziehen that syphilis is one of the most important ætiological moments in psycho-pathology" and "There is no mental symptom complex which may not owe its existence to a syphilitic infection." The second part of the book compares very unfavourably with British writers on the subject.

MATERIA MEDICA AND THERAPEUTICS.

THE eighteenth edition of Sir William Hale-White's well-known textbook on *materia medica* has been published.[1] Several additions and alterations have been made in this edition, the most noteworthy of which is an account of "Insulin." The author states: "'Insulin' is not curative of diabetes and therefore the treatment must be indefinitely long. To begin with, at any rate, it must not be given without determinations of the blood sugar, for some patients with glycosuria are not suffering from diabetes; and in *diabetes innocens* in which the glycosuria is due to abnormal permeability of the renal vessels for glucose, the blood sugar is always low and 'Insulin' easily causes dangerous hypoglycæmia." The description of the composition of cajuput oil and eucalyptus oil is confused. Cineol is eucalyptol. A conspicuous omission is any reference to the bismuth treatment of syphilis which has now gained a permanent place in therapeutics. Chiretta can be given with iron, as is correctly stated on page 583. On page 196, however, it is stated that the only infusions which can be so prescribed are those of quassia and calumba. No mention is made of para-thyreoid gland, which has been used somewhat extensively for tetany and other conditions. The antimony treatment of bilharziasis is briefly referred to, but no mention is made of untoward symptoms which may occur. Silver "Salvarsan" finds no place, nor does carbon tetrachloride nor oil of chenopodium. We would certainly expect some mention of these. A more conspicuous absence is any reference to the therapeutic applications of quinidine. Sodium morrhuate is mentioned, but chaulmoogra oil is quite inadequately presented. The dose assigned to "Luminal" (five to ten grains; three to six decigrammes) would be positively dangerous. "Ethanesal" and "Ethylene" should have been mentioned as general anæsthetics and Dreyer's de-fatted tuberculin certainly deserves some recognition which has not been accorded to it. Recent work on chronic lead poisoning finds no place in the book—a serious omission. Altogether the latest edition of Hale-White's admirable textbook is in some respects wanting.

[1] "An Introduction to the Study of Mental Disorders," by Francis M. Barnes, Junior, M.A., M.D.; Second Edition; 1923. St. Louis: C. V. Mosby Company; Demy 8vo., pp. 295. Price: $3.75 net.

[1] "Materia Medica, Pharmacy, Pharmacology and Therapeutics." by William Hale-White, K.B.E., M.D. (London), M.D. (Dublin), Honorary Colonel R.A.M.C. (T.); Eighteenth Edition; 1924. London: J. & A. Churchill; Foolscap 8vo., pp. 720. Price: 10s. 6d. net.

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Occupational Therapy.

THE recovery of a patient from a given disease depends upon several factors. Pride of place must in very many instances be given to the *vis medicatrix naturæ*. Some patients recover without any treatment and others again in spite of it. Nature is wonderfully kind to her children. That indefinable quality, the resistance of the human body, has not been completely understood nor can it always be guaged with any degree of accuracy. Resistance may be increased and assisted in various ways by the skill of the medical practitioner. This may be regarded as the second factor in recovery. The skilful practitioner will make his diagnosis with careful deliberation. He will bring to the aid of his clinical experience any mechanical and laboratory methods which may possibly be of service to him. He will plan his campaign and in the application of his therapeutic measures he will watch the effect of his ministrations on the resistance of the patient. In doing this he will not forget the third factor in recovery, namely the mental attitude of the patient. The importance of the patient's mental outlook has long been recognized. Determination to recover and a freedom from introspection will carry a sick man a considerable distance along the road to health. This object has sometimes been achieved by giving the patient something to do which will occupy his attention and prevent him from thinking about his ailments. In recent years this aspect of treatment has been extended until what is known as occupational therapy holds an important place in therapeutics.

Occupational therapy or the application of curative occupations to invalids and convalescents may be made to operate in one of two ways. The patient may either be made to undertake some work which will improve his resistance or promote his recovery in a direct manner or the occupation allotted to him may have the effect of making life happier and more agreeable and thus influence his health indirectly. In other words occupational therapy may be curative or merely occupational. Mr. Thomas B. Kidner in a recent presidential address before the American Occupational Therapy Association laid stress on the fact that occupational therapy was not to be confused with vocational training. The work suitable to a patient when he is ill or recovering from an illness may not be at all suitable to him when he is in his usual good health. Mr. Kidner pointed out, moreover, that vocational training at best can only apply to a limited number of individuals. Those who had much to do with the repatriation of troops after the late war, will bear out the truth of this statement. For this reason he said that it was impracticable to undertake vocational training to any extent in hospitals. It is obvious, however, that the two may sometimes usefully be combined. In choosing work which will help a patient the habits and home conditions of the individual must be considered and, as the cooperation of the patient is essential, his instincts and tastes must also be taken into account.

Occupational therapy may be considered from the point of view of various types of disablement. In surgical conditions, such as those following industrial accidents or in orthopædic conditions some work may be undertaken which will bring into play certain sets of muscles. Thus in surgical conditions in the neighbourhood of the ankle and foot the patient has been set to work on some apparatus such as a weaving machine operated by a foot pedal. He is taught how the weaving process is carried out and finds it a much more interesting procedure than carrying out certain set exercises. In a medical condition such as pulmonary tuberculosis occupational therapy has proved of inestimable value. In many sanatoria exercises have been mainly confined to walking. The length of the walks have been arranged according to the condition of the patient and the number of resting periods in the process have been fixed. Kidner has claimed that this does not provide sufficient mental occupation. He holds that the patient who is bored, has

neither a good appetite nor a good digestion. Reports have been made of patients who have been compelled to take exercise by carrying stones from one heap to another and nothing could be more boring. It has been found that gardening work and domestic occupations are occasionally suitable for certain types of tuberculous patients. In other instances certain forms of arts and crafts have filled the bill. This has been the case especially in those confined to bed or those described as "semi-ambulant." In mental conditions such as *dementia præcox* or in pure neuroses these principles have been applied with some success. It has been pointed out that persons suffering from such complaints may be made happier and more contented even if recovery cannot possibly be accelerated. In such individuals useful habits may by these means be formed. Finally various forms of the arts and crafts may be taught to patients with an object of making them contented and happier. Soldiers in France suffering from gun shot wounds of the femur and compelled to lie in one position for weeks on end took a keen delight in basket making, needle work and similar things.

The development of occupational therapy has necessitated the training of teachers of various occupations. In many hospitals in America a superintendent of occupational therapy is attached to the staff. It is pointed out in all discussions and reports on this subject that all work of this nature must be undertaken under the immediate supervision of the medical practitioner in charge of the patient. This is particularly necessary in dealing with tuberculosis or cardiac patients or those suffering from some surgical condition.

Occupational therapy is by no means a panacea for use in every kind of illness or for every type of patient. It has, however, a useful and at the same time a definite place in treatment and as has been shown, it may be employed to help in the alleviation of suffering and the rehabilitation of the sick. Those who are interested in the subject, and it is worthy of some attention, will find much to stimulate them in the *Archives of Occupational Therapy* which are published in America and in abstracts appearing from time to time in this journal.

Current Comment.

REFRIGERATION.

The utility of keeping industry in touch with scientific research was freely affirmed during the anxious days of the Great War. The Department of Scientific and Industrial Research was formed in Great Britain to encourage the cooperation of scientific investigators with those conducting British industries. A Food Investigation Board came into existence in 1918 and opened up many lines of inquiry. Numerous committees have been appointed to undertake researches on particular problems. The importance of cold in preserving many kinds of food has led to numerous investigations concerning refrigeration.

During the last year a Low Temperature Research Station has been established at Cambridge.[1] This Station has taken the National Physics Laboratory as its exemplar and has aimed at the highest accuracy. To attain constant conditions of temperature, humidity, composition and movement of air so necessary in critical biological work of this nature, has demanded ceaseless attention. The accuracy of the regulation may be judged from the fact that the temperature of rooms has been maintained for long periods with no greater fluctuation than 0.05 degrees. This station has attracted no less than thirty-five workers in the past year. Especial interest has been taken in the study by J. Bancroft of the effect of cold on the working heart. Exposure of the body to cold leads to lessening of the rate of the heart beat, while the volume of blood passing through the lungs and by the aorta has been increased. This is the first occasion that the pulse rate and volume output of blood by the heart have been observed to move in opposite directions.

When foods are preserved by cold, the texture and flavour should be maintained as little altered as possible. How best to attain these objectives has been the aim of ceaseless effort. It has been suggested in consequences of microscopical examinations that during freezing water separates from the substance of muscle fibres, passes through the fine membrane which covers each fibre, and accumulates between the fibres where it freezes. On thawing the reverse is observed. Water is absorbed again into the fibre so that the original structure is restored in the fibre. If the rate of freezing is sufficiently rapid the water separates within the fibre, but does not escape. It remains within the fibres as a core of ice. It would also appear to be true that the greater the rate of cooling the less does water separate. It has been asserted that no change whatever can be detected microscopically when cooling is very rapid. The correctness of these views had been accepted generally. It was held that preservation was complete if the rate of cooling exceeded a certain critical rate. The systematic work of the Low Temperature Research

[1] Report of Food Investigation Board for the Year 1923. Published by the Department of Scientific and Industrial Research.

Station has demonstrated that these simple rules will require revision. It has become evident that a wider standpoint than rate of cooling will need to be adopted. On this account the staff of the Station has abandoned its measurement of so-called critical rates of cooling for which it was primarily established. Its activities have been transferred to the study of the preservation of eggs. The results of these studies have shown that the generalization of the rate of cooling is at best only an approximation of limited application. The discovery was made that some deleterious changes in eggs become more pronounced the lower the temperature reached. It was also found that physical changes leading to a redistribution of material can take place after the eggs have been frozen solid. As the temperature of the frozen eggs is lowered a distribution of the constituents of both whites and yolks takes place. It would appear undoubted that the theory that change does not occur after freezing is not correct.

This discovery has modified the investigations of the committees concerned with the preservation of fish, meat, fruit and vegetables. Preservation by cold is not a problem concerned with the freezing and thawing of the articles to be kept. Attention must be directed to the changes occurring, no doubt slowly, in the frozen material and to the factors which modify these changes. Work of this character is of the utmost importance to Australia. From a commercial standpoint the transport of frozen mutton is satisfactory, but the transport of frozen beef to Europe supplies an article definitely inferior in texture and in flavour to fresh meat.

IMPETIGO CONTAGIOSA.

THE pathogenesis of *impetigo contagiosa* has not been accurately determined. Many authorities regard the condition as due to a special streptococcus which is held to produce the original vesicular lesions. The vesicles are supposed to become infected with the staphylococci which are always present on the skin. The pustular and crusted lesions seen in the later stages are due to the staphylococcal action. This view was held by Sabouraud, but Dockhart described a distinct follicular type of impetigo which was caused by primary staphylococcic invasion.

Dr. D. T. Smith and Dr. E. L. Burky have recently investigated the condition and have discussed its treatment in the light of their observations.[1] They studied nine cases of *impetigo contagiosa* and one of chicken pox in which the vesicles resembled those of the formed condition. The material for study was taken from unbroken vesicles by aspiration. Hæmolytic streptococci were found in six instances and hæmolytic *Staphylococcus aureus* in three. No organisms were obtained on culture from the chicken pox vesicles. Four of the streptococcal strains were *Streptococcus pyogenes* as described by Holman and two were *Streptococcus infrequens*. No differential cultural studies were made of the staphylococci. They were indistinguishable in regard to their morphology, hæmolytic powers on agar and pigment production. A streptococcus antiserum was prepared from one patient by injections of bouillion cultures into a rabbit. This serum agglutinated its homologue in dilutions of one in five thousand and all other streptococcal strains except one to some degree. All of these cultures except one were also agglutinated by an antiserum prepared from a strain of streptococcus isolated at *post mortem* examination from a patient who died from peritonitis. It was found that the homologous strain completely removed all the agglutinins from the serum after absorption and that none of the other strains were capable of absorbing any agglutinins from the immune serum. Smith and Burky point out that throughout the performance of the tests the usual difficulties found in agglutinating streptococci were encountered. At no time did they feel sure that the results obtained were not of the nature of artefacts, even though the control tests were entirely satisfactory. From these results they conclude that there was no serological unity among the strains isolated. The staphylococci were also submitted to tests with a serum prepared from a case of osteo-myelitis and were found to be serologically heterologous. Serum was collected from four patients at the time of culture of the skin vesicles. None of these sera contained any agglutinins for their homologous strains and in addition one had no bactericidal powers. Attempts were made to produce lesions by the inoculation of fresh material into the forearm of one of the observers and into the cornea and belly wall of two rabbits. In no instance was a lesion produced.

Impetigo contagiosa is usually treated by the application of ammoniated mercury ointment and many practitioners will agree with the statement of Smith and Burky that the results obtained by the application of this ointment are often very variable. These two observers found that the difference in response to treatment could be explained as a result of bacteriological examination. They found that the lesions from which staphylococci were isolated, were very resistant to treatment by ammoniated mercury ointment. This finding was so constant that the nature of the organism could be foretold from the character of the response to treatment. Then they searched for a more efficient method of treatment and determined to apply Churchman's finding that gentian violet was highly bactericidal for staphylococci in the knee joint. They found that a 5% solution of gentian violet in 20% alcohol was effective in all instances. It was necessary to keep some ointment applied over the gentian violet in order to prevent scab formation.

In regard to the causation of the disease Smith and Burky conclude that it cannot be ascribed to any serological or cultural species of organism or to any genus of cocci. They point out that this finding agrees with those of Farley and Knowles and of Bommer who obtained from the lesions cultures of streptococci, staphylococci and diphtheroids. They think it is most likely that the organisms are secondary invaders dependent on the local flora of the skin. Impetigo may be caused by an unknown specific virus and may follow some known or unknown injury to the skin.

[1] *Bulletin of the Johns Hopkins Hospital*, March, 1924.

Abstracts from Current Medical Literature.

PÆDIATRICS.

Hæmangio-Endothelioma.

M. E. BLAHD, A. S. MASHKE AND H. T. KARSNER report an instance of hæmangio-endothelioma of the ileum in an infant two months old (*American Journal of Diseases of Children*, October, 1923). The infant was admitted to hospital with a history of persistent vomiting. The illness began four days previously with regurgitation of food. At first only milk curds were vomited. This was followed by the vomiting of greenish fluid and later by fæcal vomiting. There was complete absence of stools. Physical examination revealed a distended abdomen, prominent abdominal veins and definite peristalsis. A tumour mass was not palpated. A barium meal revealed definite stasis in the ileum. Twenty-four hours after the barium meal none was seen in the caecum. A diagnosis of intestinal obstruction was made. On opening the abdomen a tumour of the consistence of a congenitally stenosed pylorus was disclosed. This constricted the ileum at a point about eighteen centimetres from the ileo-caecal valve. On account of the poor condition of the patient no attempt was made to resect the tumour. An ileostomy was performed. The following morning faecal vomiting recurred. This continued until the death of the infant a few hours later. The tumour removed after death was found to be a capillary hæmangioma. There were also present a considerable number of endothelial cells, sometimes in fairly large masses. The descriptive term hæmangio-endothelioma is therefore employed.

Xanthoma Tuberosum with Diabetes Insipidus.

J. P. CROZER GRIFFITH (*Archives of Pediatrics*, September, 1923) gives the final report on a case of *xanthoma tuberosum* with *diabetes insipidus*. He gives a brief résumé of the history as already published. The child was a boy of nine years at the time of admission to hospital in September, 1921. He exhibited typical xanthomatous growths on various parts of the cutaneous surface and in addition scars on the scalp where there had clearly been diseased bone. These growths had been present over a year. In addition the child exhibited icterus which had been present without intermission for about a year. For several months he had also suffered from polyuria and excessive thirst. There was definite enlargement of the liver and moderate hypertrophy of the spleen. The X-ray examination revealed multiple tumours of the skull, but no evidence of any lesion of the pituitary body. From five thousand to eight thousand cubic centimetres of urine with specific gravity varying from 1001 to 1010 were evacuated daily. Hypodermic injections of pituitary extract controlled the polyuria. Little other benefit resulted. The combination of *diabetes insipidus* with *xanthoma tuberosum* seemed almost unique. The child died in December, 1922. An autopsy was made by W. J. Freeman. Widespread xanthomatous infiltrations were found in various parts of the body. The liver contained multiple tumours which effectively explained the blocking of the bile-ducts. There was likewise infiltration in the lungs, the pineal gland, the floor of the fourth ventricle, the *tuber cinerum*, the infundibulum, the pituitary body and the skull. The chief interest in this connexion was the condition of the pituitary body. It was not enlarged or altered materially in shape. The posterior lobe was thoroughly infiltrated by xanthomatous tissue which largely replaced the neutral elements. The anterior lobe was affected to some extent. This explains the disturbed function of the pituitary in the producing of *diabetes insipidus*. The fact that the X-ray examination revealed no change in the size of the gland nor of the *sella turcica* is also explained.

Exophthalmic Goître in Children.

H. HEIMAN (*American Journal of Diseases of Children*, September, 1923) discusses exophthalmic goître in children. After discussing the age and sex incidence, ætiology and pathology the author turns to the symptomatology. The cardinal symptoms, tachycardia, exophthalmos, and enlarged thyreoid gland are present in children. The exophthalmos is usually less definite in children than in adults. In the author's three patients it was quite definitely present. The degree of exophthalmos was in direct relation to the severity of the condition. The patient who had the most rapid pulse rate and the highest basal metabolism, had the most noticeable prominence of the eyes. Graefe's and Stellwag's signs were present in all three instances. The basal metabolism in the three children before treatment was as follows: The first child's basal metabolism was + 12%, that of the second + 20% and of the third + 52%. An unusual manifestation in one of the patients was the development of severe recurrent attacks of ketosis. The first time the author saw this child at the age of four years, he found him in deep coma. There was hyperpnœa without cyanosis. The temperature was 39.5° C.. There were definite convulsive twitchings of all the extremities. After subcutaneous injections of 5% glucose solution, frequently repeated, the improvement was definite. The patient subsequently had three similar attacks. The treatment of exophthalmic goître in children differs little from that of adult patients. One of the author's patients, aged five years, was operated on by Dr. Crile. A partial thyreoidectomy was performed. Three months later definite improvement in her condition was noted.

Hypertrophic Pyloric Stenosis.

J. F. POYNTON, T. T. HIGGINS AND J. M. BRYDSON (*The Lancet*, February, 1924) discusses the present position of the treatment of hypertrophic pyloric stenosis. The authors have arrived at the conclusion that once the diagnosis has been made, operation should be carried out at the earliest opportunity. In the diagnosis they lay special stress on the palpation of the tumour. Their experience has been that so far they have only failed to find the tumour in once instance. They have had no instance in which death has occurred and an undetected tumour been discovered. In no instance, when a tumour has been felt, was it non-existent at operation. The following is the method of examination used: In order that the examiner may relax his muscles, he sits beside the cot on the left side of the infant. The nurse gives the infant a feed of milk or glucose water. The left hand, thoroughly warmed, is laid flat over the epigastrium. The edge of the liver is defined by the upper border of the index finger. The pylorus is then traced with the pads of the fingers used with the lightest possible pressure. The difficult tumours are those which lie high up under the edge of the liver, but these can usually be detected on inspiration by their harder consistence. Having felt the tumour the authors only wait for the child to recover from collapse before beginning preparations for operation. No patient is considered too ill for operation. The great hindrance to success is the duration of the symptoms. It is important to have the stomach empty at the time of operation. A short course of gastric lavage is therefore considered an essential preliminary, especially when the condition is of long standing. The final washout is done an hour before operation. To combat shock subcutaneous infusions of saline solution with glucose (2%) are administered, usually twice. The last feed is given four hours before operation. Gas and oxygen anæsthesia is used. Frequently this is combined with local infiltrations of the abdominal wall with "Novocaine" and adrenalin, with the object of diminishing shock and rendering the closure of the peritoneal cavity more easy. The total number of patients dealt with in the present paper is twenty. Of these sixteen have been cured, four have died, giving a mortality of 20%. The authors' conclusions are that in the present state of knowledge of the pathology of this condition operation offers the most speedy and certain cure of the disease, that the most suitable operation is Rammstedt's, and that the only absolute diagnostic sign is the palpation of the tumour. They add that the best results are obtained when the operation is performed at the earliest possible moment after the onset of symptoms.

ORTHOPÆDIC SURGERY.

The Remote Results of Operations for Injuries of the Peripheral Nerves.

HARRY PLATT AND W. R. BRISTOW (*The British Journal of Surgery*, January, 1924) publish a paper representing the British report on the remote results of operation for injuries of the peripheral nerves. They deal with the various aspects causing recovery and come to the conclusion that results of end to end suture in case of gun shot lesions are for the most part imperfect. Complete failures were found in about 20% of the patients examined. This does not apply to all peripheral nerves as some, such as the musculo-spiral, show complete restoration of function in at least 50% of the successful cases. The ulnar and the median nerves give disappointing results on the whole and in very few instances do the small muscles of the hand supplied by these nerves recover their function. Similarly the results of static nerve sutures are poor. The most prominent cases of failure are: (i) Changes in the nerve above the line of suture due to wound infection; (ii.) topographical confusion in regeneration. The operations of indirect nerve repair such as lateral implantation have proved ineffective and the value of nerve grafting has still to be demonstrated. In the nerve lesions associated with profound irritation resection and suture or the intra-neural injection of alcohol will rarely fail to bring about immediate and complete relief from pain, but at the cost of the loss of function associated with a complete nerve lesion.

Snapping Shoulder.

W. R. BRISTOW (*Journal of Bone and Joint Surgery*, January, 1924) reports a case of snapping shoulder. The disability consisted in an inability to abduct the arm fully. Abduction was accompanied by a painful snap in the region of the shoulder. The trouble dated from an accident which occurred fifteen years previously when the patient fell on her shoulder. Examination did not reveal anything abnormal, but at operation a thick fleshy muscle was found covering the lesser tuberosity. This arose from the outer side of the short head of the biceps and the fibre ran upwards and downwards towards the long head. The muscle was considered to be the *rotator humeri* of the lower animals. It is not an uncommon abnormality in man.

Fractures of the Femur.

R. HAMILTON RUSSELL (*The British Journal of Surgery*, January, 1924) outlines the principles of treatment in fractures of the femur as practised by him at the Alfred Hospital, Melbourne. A simple fracture should never be subjected to operation unless there is mechanical impediment of the reposition of the fragments. An operation is not justified when its purpose is merely to fix fragments in position. In the greater number of cases fragments can be easily brought into good position and maintained there by means of the treatment he outlines. The thigh is shortened by the tonic contraction of certain long muscles whose tone makes them behave like rubber bands slightly stretched. The correct length is maintained by the femur and as soon as the femur is broken the muscles shorten and produce over-riding of fragments. The first aim in treatment is to pull these muscles out to their correct length, every other structure in the thigh will then be in its correct position including the fragments. Exact anatomical reposition is not always obtained nor is it always desirable. The author lays stress on applying extension only to the tibia and fibula. He has devised an apparatus for supporting the weight of the lower limb and at the same time obtaining suitable extension. The only other feature needing special attention in addition to extension is to counteract the effect of gravity at the seat of fracture and this, he contends, is done by his method of treatment.

Ætiology and Treatment of Claw Foot.

G. P. MILLS (*Journal of Bone and Joint Surgery*, January, 1924) deals with the ætiology and treatment of claw foot. After reviewing the various suggestions with regard to excision he comes to the conclusion that the temporary paralysis or paresis of the muscles supplied by the external plantar nerve is the cause. Shortening of the *tendo Achillis* is not an essential proof of deformity but is present as a complication in about one quarter of the cases. Treatment for various stages of the condition is outlined. Moderate deformity is treated by fasciotomy, tenotomy and transplantation of the *extensor brevis pollicis* to the metatarsal bone with division of the long flexor tendon and with lengthening of the *tendo Achillis*. When the condition is advanced, excision of bone is necessary.

Apophysitis of the Os Calsis.

NATHANIEL ALLISON (*Journal of Bone and Joint Surgery*, January, 1924) draws attention to the changes in two instances of apophysitis of the *os calcis* and the similarity between those changes and those seen in *osteochondritis deformans juvenilis*. The changes in each condition come on at a period of great activity in bone growth—the seventh to the fourteenth year—and the cause of each is not definitely known. Radiograms of the heels of the author's two patients are produced. The author points out that there is no evidence of formative activity of the bone at all. The changes are those of a sub-chondral bone destruction.

The Pattern of Weakness of the Hand in Ulnar and Median Nerve Lesions.

MUSCLES of the hand and forearm sometimes derive their nerve supply from two nerves and the degree of injury to the ulnar or the median nerve is sometimes difficult to determine. L. J. Pollock (*Surgery, Gynecology and Obstetrics*, March 1924) examined the records of eighty-six cases of injury. Of these twenty-eight were injuries to the median nerve, thirty-three to the ulnar nerve and twenty-five to the ulnar and median nerves combined. The instances of injury to the median are analyzed into four groups which are illustrated by diagrammatic representation of the changes. Ulnar nerve lesions are dealt with similarly. The author is of the opinion that physiological interruption cannot be differentiated from anatomical section by the strength of the movements of the phalanges of the fingers. It is emphasized that recovering or incomplete lesions of the median nerve may almost regularly be determined by sensory examinations whereas in ulnar lesions this does not apply.

Transplantation of the Tensor Fasciæ Femoris in Paralysis of the Quadriceps Muscle.

NORTON DUNN AND F. W. STEWART (*The British Journal of Surgery*, January, 1924) lay down a safe clinical test in the selection of tendons for successful transplantation in the lower extremity, namely that the muscles transplanted should be those used by the patient in his effort to replace the action of the paralysed muscle. In an appreciable number of instances of infantile paralysis the power of extending the knee joint is lost while the sartorius and the *tensor fasciæ femoris* may be healthy. The authors contend that if such a patient is asked to extend the knee-joint, one or both of these muscles will contract. By altering their insertion to the patella their contraction becomes effective in extending the knee joint. An operation is described for transplanting the *tensor fasciæ femoris* and has been carried out in two instances. The skin incision is made from the anterior superior spine to a point below the knee joint on the lateral side where it curves across the tibia. Flaps are raised on either side, the anterior one sufficiently to expose the patella. The anterior and posterior borders of the *tensor fasciæ femoris* throughout its length are exposed. From the two borders of the muscle two incisions extend downwards to the knee joint separating a strip of fascia equal to the breadth of the muscle at its insertion. This long ribbon of fascia and muscle is freed and transplanted to the quadriceps tendon and to patella. No strain should be put on the new insertion for six weeks and re-education is necessary. In both the instances reported the transplanted muscle hypertrophied and active extension of the knee became possible.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE SOUTH AUSTRALIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held in the Lister Hall, Hindmarsh Square, Adelaide, on Friday, March 14, 1924, DR. JAMES RIDDELL, the PRESIDENT, in the chair.

The Council of the Branch had decided to hold the monthly meeting on the evening of March 14, as the Post-Graduate Course on "Insulin" had been held on that afternoon and so the members of the Branch who had come from the country to the course, had the privilege of attending the monthly meeting of the Branch.

Carcinoma of the Kidney.

DR. G. H. BURNELL showed a specimen of a squamous celled carcinoma of the kidney. As was usual in this type of case, the growth was associated with multiple calculi in the renal pelvis, the chronic irritation of the calculi being the causative factor. Sections of the growth in places showed typical "cell nests" such as occurred in squamous-celled carcinomata in other places.

Pyelograms.

Dr. Burnell then showed two pyelograms, one from a case of calculous pyelitis and the other from a case of renal hæmorrhage. In both instances the pelvis of the kidney showed a normal outline. The solution used in each case was a 20% solution of sodium iodide.

Case for Diagnosis.

Dr. Burnell next presented a patient, a woman, aged thirty-six years, married, who gave the following history: In May, 1921, she had had an operation on the dorsum of the right wrist for the removal of a small tumour which was said to have been a fibroma. Immediately after the operation the wound had broken down and commenced to bleed and had continued to do so until May, 1922, when Dr. Burnell had first seen her. On examination the wound showed no tendency to heal and appeared as if it had been made only a few days previously. The original wound was excised and sown up, but as soon as the sutures were removed the bleeding had continued and in spite of all measures, including the coagulation of the tissues on two separate occasions by the diathermy current, the wound had continued to bleed. At the meeting the wound was still bleeding.

The excised tissues on examination had shown no signs of syphilitic or tuberculous infection and serum had not reacted to the Wassermann test. Blood counts and examination of blood films had revealed no abnormality.

Two months previously a supra-pubic incision which had been made eighteen years previously, had broken down and commenced to bleed in a similar manner. The incision had been made for some gynæcological procedure and had healed well.

Ordinary cuts of the hand and other places healed well and rapidly without excessive bleeding. There was no history of any bleeders in her family. Dr. Burnell asked members for a diagnosis of the condition and asked for advice as to further treatment.

In the discussion the general opinion of members was that the wound was kept open by the patient herself by means of some external irritation.

Rodent Ulcer, Treated by X-Rays.

DR. STANLEY VERCO showed a man who had had a small dark mole on his temple all his life. Eighteen months previously after a trifling injury it had commenced to enlarge and from time to time it had discharged. When first seen there was an ulcer about the size of a shilling with heaped up edges and covered with a dry secretion. Clinically it had appeared to be a rodent ulcer. On November 1, 1923, it had been treated by X-rays. On December 15, 1923, as the ulcer had not quite disappeared a further treatment had been given. When seen on January 3, 1924, it had been quite healed and he had had no further treatment since.

Carcinoma of Breast Treated by X-Rays.

Dr. Verco's next patient was a woman who two and a half years previously had had a breast amputated for carcinoma. The breast had been about to ulcerate and the axillary glands had been affected and were very large. Dr. Verco said that she had received some post-operative treatment with the plant which he had then had at his disposal. Two years after the operation there had been a recurrence in the scar with great pain. When seen there had been a tumour as large as a walnut and it appeared about to ulcerate. On September 19, 1923, she had been given deep X-ray treatment and the pain had been relieved within seven days. When seen on October 24, 1923, there had been a severe skin reaction and the tumour had shrivelled and was level with the skin. Two weeks later the site of the tumour had been marked by a dimple only. Seen on February 1, 1924, the dimple was filling up and there had been some local pain and so a further treatment had been given with relief of the pain and with regression of the tumour. Dr. Verco said that this time he would give further treatment.

Carcinoma of Both Breasts Treated by X-Rays.

Dr. Verco's third patient was a woman who in May and June, 1923, had undergone a palliative operation for fungating cancer of both breasts. On December 6, 1923, there had been a recurrence under the left scar the size of half a hen's egg and an even bigger one on the right side where also there were recurrences in the stitch holes and in the scar throughout its entire length. Deep X-ray treatment had been given and within six weeks the lumps had been reduced to one-third of their original size. On January 11, 1924, a second treatment had been given and this had produced a severe skin reaction. Now the left tumour could only just be palpated as a small nodule under the skin, the right tumour could not be felt and the skin recurrences had all but disappeared.

Membranous Epiglottis.

DR. H. M. JAY said that he wished to draw the attention of members of the profession to a matter mentioned by W. M. Wharry in *The British Medical Journal* of August 25, 1923, namely the embarrassment to respiration during anæsthesia by a membranous epiglottis. Within a week of reading of this he (Dr. Jay) had come across a precisely similar case.

During induction of anæsthesia prior to tonsillectomy, the patient (a child of five years) had exhibited signs of respiratory embarrassment which had not been relieved by pulling the lower jaw forward or by traction on the tongue. The chest had moved as if the patient were making inspiratory efforts, but it could be seen that they were ineffectual in procuring a free supply of air.

A digital examination of the larynx revealed the fact that a membranous epiglottis was acting as a flap valve and completely closing the glottis with each inspiratory effort.

The problem of keeping the epiglottis back whilst the operation was performed, was solved by passing the nasal tube of a Shipway apparatus down to the level of the glottis. He considered that the condition was probably much more common than it was thought to be and warned surgeons and anæsthetists to be on the lookout for it.

Davis Boyle Mouth Gag.

DR. GILBERT BROWN showed the Davis Boyle gag. He said that this was a combined gag and tongue depressor which had been invented by Davis in America for use in "dissection tonsillectomy." There was a terminal on the tongue depressor for an anæsthetic tube from any vapour apparatus and this led to the pharynx by a metal channel. Once in position a perfect view of the whole palate and tonsillar fossæ was obtained and one finger kept the gag in position and the tongue and jaw forward. Dr. Brown then described a case of an adult who had undergone an

operation for complete short palate. A Connell apparatus had been used to supply the ether vapour and to provide suction. The result had been a perfect view, a continuous operation and a dry clear field. Only six swabs had been used to wipe away any clot.

Dr. Brown said that the gag was particularly useful when bleeding points in the tonsillar fossæ had to be picked up. Some operators complained that the tightness of the faucial pillars made tonsillectomy more difficult. Illustrations of the gag in use were shown in Boyle and Hewers's "Practical Anæsthetics" and in Hewers's "Anæsthesia in Children."

Foreign Body in the Trachea.

DR. LIONEL D. COWLING then read a report of an unusual case of foreign body in the trachea of a young child (see page 489).

DR. CHARLES T. TURNER read a paper entitled: "Blood Transfusion: Its Technique and Some Effects in Disease" (see page 483).

THE PRESIDENT thanked Dr. Turner for his very interesting and instructive paper. He congratulated him on his results and said that he felt sure that the country members who had come to Adelaide for the Post-Graduate Course that day, would agree with him that they had all learned a very valuable lesson from the paper. He said that they would all go away from the meeting with far less fear of blood transfusion and with the knowledge that it could be carried out even away from hospital and in a private house.

Before opening the discussion on the paper, the President said that it was very gratifying to see such a good attendance at the initial Post-Graduate Course. He himself had seen members from the north as far as Port Pirie and from the south as far as Mount Gambier. He wished to say that members who were at the Course that day, had been very pleased and had asked him to express their thanks to the Branch Council for suggesting the course and also to the Post-Graduate Committee for their work in arranging the lectures and demonstrations. He felt sure that the success of the first course would be a great incentive to the Committee to arrange further courses and he would even suggest that they might be held twice yearly. In particular, on behalf of those who had attended the course, he wished to thank Professor Brailsford Robertson, Dr. C. T. de Crespigny, Dr. F. S. Hone and Dr. W. Ray for their kindness and work in giving the lectures and demonstrations.

DR. F. S. HONE, said that he was very pleased to open the discussion on Dr. Turner's paper, more especially as four of the patients reported that evening had been under his care and he had felt as he had watched Dr. Turner's work that it ought to be more widely known to the profession at large. For that reason it was a very happy idea that the council had arranged this meeting at the close of the post-graduate day on "Insulin," when so many of the country members were present. Dr. Turner had not done himself justice in one particular, in that he had not mentioned that one of the transfusions of a boy suffering from hæmophilia had been done at midnight in a country town after a hurried motor trip from the Adelaide Hospital. It was quite possible for members to think that this operation was easy in a well equipped hospital, but this case showed the wide application possible under disadvantageous circumstances by means of the technique described in the paper.

What had impressed him in the cases he had seen had been the careful attention to detail in doing the transfusion and the scientific accuracy of the method. As had been said in the paper, blood transfusion had been under trial for a very long time. In the current number of *The Practitioner* he had read that night the description of how transfusion had been done in London within twenty years of Harvey's discovery of the circulation of the blood—in that case through the jugular vein. As a student and house surgeon nearly thirty years previously, he could remember seeing it done in exceptional cases. But the methods then used were uncertain in their results and cumbersome in execution. The discovery of blood grouping had for the first time made a more scientific procedure possible; and the technique described that evening made it with a little experience comparatively simple in procedure.

Of those under his own immediate care, the patient suffering from splenic anæmia had been in a practically hopeless condition and it was hardly fair to include him in the list. The patient had been shown at a previous meeting of the Branch, transfusion had been suggested and declined, the patient had been allowed to go home, had had another severe hæmorrhage, had been returned to hospital blanched and in a hopeless condition and transfusion had been attempted as a last resort.

In the patient with gastric ulcer the result had been very striking. As had been stated, the patient had had several hæmorrhages before admission, his house surgeon had suggested transfusion when first admitted, but he had deferred it, as these patients generally (some said always) recovered from their hæmorrhage. Late in the day, however, a further severe hæmorrhage had sent the patient's pulse rate so high and had so reduced his general condition that Dr. Hone had felt it was not safe to refuse it. What had impressed him in this instance was the relative rapidity of convalescence as compared with other cases of hæmatemesis from peptic ulcer where transfusion had not been done.

The patient suffering from pernicious anæmia was an old woman who had been ill a long time and was pretty far gone. Here again the improvement, though not permanent, had for the time been definite and immediate. He quite agreed with Dr. Turner that in the future transfusion should be done earlier. With modern views as to its causation by hæmolysis from streptococcal duodenal infection (preceded according to Hurst by *achylia gastrica*,) transfusion, while other measures were given time to act, was a quite rational expedient and he was looking forward with interest to seeing further results in these conditions.

The most striking case in his series was that of a young woman whom Dr. Turner had included amongst the cases of hæmophilia. He could not agree with him that this was the actual condition present. The patient was a young woman, which was very unusual in hæmophilia. There had been no family history of the disease. Except for easily bruising she had always been strong and healthy until some months before admission and two years previously she had had all her teeth removed and the wound had only oozed—not bled freely—for twenty-four hours after; also the coagulation time of her blood was only four and three quarter minutes as against forty-five minutes usual in hæmophilia. The blood picture on admission had been more like an aplastic anæmia than anything else. The blood platelets had been reduced as in *purpura hæmorrhagica*, but although there were menorrhagia and, as has been narrated, almost persistent epistaxis, there had been no history or evidence of any purpura unless actual hæmorrhages were regarded as such. The fragility of corpuscles had been increased, but in a sense different from acholuric jaundice. The most marked feature in the picture was the complete absence of any evidence of activity of bone marrow, the nature of cells seen, the rapid fall during the week she had been under observation of erythrocytes from two and a half million to less than two millions and of leucocytes from 3,600 to 1,800. But whereas in aplastic anæmia transfusion was said to be useless, in this case the effect had been dramatic and the vidence of activity of bone marrow had become most pronounced within the next week. The patient had been seen at monthly intervals since and was keeping in exceedingly good general health. The case showed the advantage of trying transfusion in a patient with a doubtful blood picture. That and the other cases narrated that night showed that apart from surgical and obstetric emergencies, blood transfusion was capable of wide application in medical conditions. For a striking feature in the series had been the way in which one transfusion had not only relieved a profound anæmia, but in some way checked further hæmorrhages developing. For this reason Dr. Turner deserved the thanks of members for bringing this series of cases before

them and he personally was deeply grateful not only for the interesting and instructive paper, but for the assistance rendered in the treatment of patients who had been under his care.

DR. H. M. JAY expressed his appreciation of Dr. Turner's paper and emphasized its extremely practical nature. The outstanding merits of blood transfusion in practical hands appeared to be its safety and its certainty. In surgical conditions a point of great importance appeared to be that not only were the symptoms of urgency overcome, but the liability to recurrence of hæmorrhage was slight. In the case of secondary hæmorrhage following tonsillectomy mentioned by Dr. Turner, the results had been even more dramatic that Dr. Turner had stated. When the patient had been taken from the operating theatre at 10.30 p.m. the pulse had been one hundred and fifty. Transfusion had been completed shortly before 1 a.m. and the pulse rate immediately afterwards had been one hundred. One hour later it had been ninety.

ANNUAL MEETING.

WESTERN AUSTRALIAN BRANCH.

THE ANNUAL MEETING OF THE WESTERN AUSTRALIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the Hospital for the Insane, Claremont, on March 23, 1924, DR. D. M. MCWHAE, C.M.G., C.B.E., the PRESIDENT, in the chair.

Treasurer's Report.

THE TREASURER'S report was received and adopted on the motion of MR. F. A. HADLEY, seconded by DR. J. BENTLEY, M.C.

President's Address and Report of the Council.

DR. MCWHAE read the following address which incorporated the Annual Report of the Council. The report read as follows:

REPORT OF THE COUNCIL.

I have pleasure in presenting the Annual Report of the Council and the Branch for 1923.

The Council held nine meetings during the year and the average attendance of members was seven. The Council considered many important matters, some of which I desire to refer to briefly.

Uniform Incorporation of Branches Throughout the Empire.

With a view to uniformity the Parent Branch and the Federal Committee have conferred and submitted uniform Articles and Memorandum of Association.

The Council have these under consideration and after taking legal advice will submit them to General Meeting for consideration and adoption.

Australian Air Forces: Fees for Medical Examination of Candidates.

Your Council has approached the Federal Committee with reference to the low rates paid to medical officers for examination for entrance to the air force. This matter has been supported by the Federal Committee which has approached the Defence Department. This will, we trust, result in satisfactory fees being paid in future.

Local Representative of The Medical Journal of Australia.

At the instigation of the Editor of the Journal the Council have agreed to the appointment of DR. H. B. GILL as the local representative of the Journal. The Council feel sure that the Western Australian Branch will greatly benefit by his undertaking this work.

Contract Practices and Appointments.

During the year the Council has had various communications with doctors in reference to their agreements covering timber mill, mining and naval appointments and has, so far as it can, supported the members to secure equitable and better terms.

Model Lodge Arrangements.

An unsatisfactory condition has existed as the Albany lodge rates of twenty-six shillings are lower than the country district rates of thirty shillings, and with a view to uniformity and after corresponding with the Albany doctors it has been agreed at their request to apply the uniform country rate of thirty shillings throughout the State, and the matter is now under consideration by the Friendly Societies' Council.

Re Mr. W. J. Hancock, late Honorary Radiographer, Perth Hospital.

In view of the great damage that Mr. Hancock has sustained to his hands and health as an early X-ray worker in his honorary capacity as radiographer at the Perth Hospital from 1896 to 1920, your Council (represented by Drs. Clement and Trethowan) in conjunction with the Australian National Research Council, the Royal Society and the Honorary Staff and Board of the Perth Hospital, formed a Committee to approach the Premier to secure for Mr. Hancock some recognition of the long and faithful service in which he has suffered so greatly. I am quite sure we all hope that the Government will grant him the reward he deserves.

National Insurance.

As you are doubtless aware the Commonwealth have appointed a Royal Commission to inquire into the question of national insurance. In response to a request for information from the Royal Commission, we have supplied the number of members in this State and copies of the Lodge and Timber Mill Agreements, and Dr. Anderson has given evidence before the commission. The proposal is for a compulsory scheme which will include all workers whose income is £300 *per annum* or less. The Commission desires to evolve a satisfactory and workable scheme and in order to avoid initial mistakes it desires to consult all bodies concerned, including the medical profession. It estimates that there are 1,500,000 wage earners in Australia of whom 500,000 are members of friendly societies. The remainder are not thrifty and are not provided for as regards medical attendance and a compulsory scheme is desired which will include these.

At a meeting of representatives of the British Medical Association with the Chairman and Secretary of the Royal Commission in November, 1923, in Melbourne, it was pointed out that a very large number of the 1,000,000 non-members of friendly societies preferred to make their own private arrangements for medical attendance and that they would probably continue to do so under national insurance and would thus be penalized. It was also pointed out in answer to a question from the Chairman of the Royal Commission that much better service would be obtained from medical men who were also engaged in private practice, than from medical men who were restricted entirely to panel work.

Election of Member to Council of Great Britain.

The Council recommended the re-election of DR. DUNHILL who also represented the Victorian Branch.

Members.

The membership of the Branch was well maintained. The number of members last year was one hundred and sixty-three and this year was one hundred and sixty-five.

It is with much regret that I have to report the death of Dr. Thomas John Lonergan who was District Medical Officer at Bridgetown. Dr. Lonergan was in practice for twenty-three years in this State and was an old and esteemed member of the Branch. A letter of condolence was forwarded to his widow.

I also report with much regret the death of Dr. Nyulasy who always took such a live interest in the working of the Branch. He will be greatly missed by all of us. A letter of condolence has been sent to his brother.

Medical Congress.

It was decided owing chiefly to lack of adequate accommodation on account of the rebuilding of the University

not to issue an invitation to hold the next Congress in Perth.

General Meeting.

I now come to the General Meeting. Eight meetings were held with an average of twenty-six members per meeting. The opening meeting was held at the Hospital for Insane, Claremont, through the kind invitation of Dr. J. T. Anderson, Inspector General for Insane. I desire to acknowledge the indebtedness of the Branch to Dr. Anderson and to express your grateful appreciation of his hospitality. The September meeting at Dr. Crisp's kind invitation was held at the Children's Hospital. All the other meetings, including a clinical meeting arranged by Dr. Mackenzie, were held at the Perth Hospital. Cases and specimens were shown by Drs. Bostock, Couch, Crisp, F. Gill, Hadley, Holland, Joyce, Juett, Kenny, Mackenzie, McGregor, McWhae, Moss and Nyulasy. Interesting and instructive papers were read by Drs. Bostock, F. Clark, F. Gill, Hadley, Jull and Shearman.

Dental Clinics.

At the first meeting of the year at the instigation of the Western Australian Odontological Society the question of the provision of public dental clinics for those unable to pay was discussed. Towards the end of the year a further request was received from the Odontological Society with reference to the dental treatment of children in schools, in connexion with which they proposed to arrange a deputation to the Premier. It was resolved to cooperate with the Odontological Society in this matter and as soon as the deputation is arranged the Council will send representatives to support it.

Purchasing Land.

The matter of purchasing land was raised by Dr. Holland at the first meeting of the year. It was discussed at one or two further meetings, but further consideration of it was deferred, as there is a scheme on foot for a doctors' cooperative company known as the Hospital Electrical and Radium, Limited, to acquire land and build and provide accommodation for the Association.

Treatment of Accidental Injuries.

Early in the year, MR. HADLEY opened a discussion on this subject by reading a short paper on the need and possibilities of organization throughout the State. The matter was very fully discussed, a sub-committee was formed consisting of MR. HADLEY, DRS. TRETHOWAN, ATKINSON, F. GILL and ARKLE. The sub-committee's report of June 6, a copy of which was sent by circular letter to all members of the Branch, outlined the proposed scheme very fully. In July the sub-committee's report was received and adopted and in August a sub-committee was elected consisting of MR. HADLEY, DRS. ABERDEEN, F. GILL, JUETT and EAST to act with the Principal Medical Officer to carry out the sub-committee's recommendations. I am afraid, however, that at this point the whole matter has come to an untimely end.

Friendly Societies and Out-Patients' Treatment at Public Hospitals.

Last May a proposal by the Perth Hospital Board of Management to alter the By-laws in order to make members of friendly societies eligible for out-patient treatment was considered by the Branch and was strongly opposed with the result that the suggested alteration was not made.

Spiritual Healing Mission.

At the General Meeting held in May of last year the question of the Hickson Mission was considered and it was resolved, that the members of the Branch should not actively associate themselves in any way with the mission. In July owing to a statement in the public press that a committee of medical men would act at the forthcoming Hickson mission, it was considered necessary to publish the resolution of the Branch that members should not actively associate themselves with the mission and furthermore that the Branch was of opinion that if a thorough test from a medical point of view was to be made, people submitting themselves to faith healing should be medically examined both before and after such treatment. When the Hickson mission was over the Royal Society under the presidency of Professor Ross suggested cooperation with the Branch in a scientific investigation of faith healing and this was agreed to.

Infantile Welfare and Ante-Natal Clinics.

At the meeting of June 20, 1923, the question of clinics under municipal and other authority was considered. At the July meeting, the Council's report and recommendations were adopted, *videlicet* it was not unethical for medical men to carry out this class of work and that clinics should be available to all men in the district.

A special committee has been formed by the Department of Public Health to carry out this work and the Association is represented by its President.

Medical Defence Union.

Under the British Medical Association Constitution no Branch can undertake any system of medical defence. On several occasions, however, after general meetings this matter has been discussed. In this connexion I wish to report that a proposal to establish a Federal defence union has been brought before the Federal Committee.

Medical Fees for Insurance Examinations.

From time to time the matter of medical fees for insurance examinations has been considered and it has been agreed that the medical fee for life insurance examinations should be not less than one guinea. During the year it was discovered that the Manchester Unity Independent Order of Oddfellows' Society was issuing an endowment policy and offering a fee of ten shillings for medical examination. Members, therefore, should be on guard against taking a lower fee than that agreed upon.

Alleged Hospital Abuses.

As the question of hospital abuse was brought under the notice of the Council, the Council recommended the appointment of a sub-committee to inquire into the matter. The sub-committee was duly appointed consisting of DRS. CLEMENT, MERRYWEATHER and EAST, with President and Honorary Secretary *ex officio*. The Committee has the matter in hand and is inquiring into the system of admitting patients to the larger hospitals. When its report is received further consideration will be given to the matter.

Opticians' Bill.

Towards the end of last Parliament, the Opticians' Bill was again brought up. As you are doubtless aware the bill was shelved before the end of the session.

Visit of Sir William Macewen and Annual Dinner.

The Annual Dinner coincided with the visit of Sir William Macewen and the Branch had the great honor of entertaining this distinguished visitor. The dinner was largely attended, there being forty-four present.

Australasian Medical Congress (British Medical Association), 1923.

A number of members attended this Congress which was from every point of view a most successful one. The thoroughness and efficiency of the administrative arrangements for this Congress may serve well as a model for future congresses. It is impossible to express adequately gratitude for the great hospitality received.

Election of Office Bearers.

There was no election this year as the required number of members to fill each post was duly proposed and seconded. For various posts there were one or two other members proposed but not seconded and there were three other members proposed and seconded, but they declined to stand for office. I, therefore, declare the following office bearers for 1924:

President: DR. D. P. CLEMENT.

Vice-President: DR. FERGUSON STEWART.

Ex-President: DR. D. M. MCWHAE.

Honorary Treasurer: DR. W. TRETHOWAN.

Honorary Secretary: DR. T. L. ANDERSON.

Members of Council: DR. R. C. E. ANDERSON, DR. A. H. GIBSON and DR. R. C. MERRYWEATHER.

Members of Ethical Committee: DR. G. W. BARKER, DR. H. B. GILL and DR. W. H. NELSON.

DR. G. W. BARBER who has been on the Council for the last four years, asked to be relieved and declined to nominate again. I regret that Dr. Barber would not again stand. I take this opportunity on behalf of the Council to thank him for his valuable services. I should like also to thank the members of the Association for the support they have given me and I specially desire to thank the members of the Council for their loyal support during the year.

Election of Auditors.

Under Rule 60 DR. M. K. MOSS and DR. A. E. RANDELL were elected as auditors for the year 1923-1924 on the motion of DR. J. T. ANDERSON seconded by DR. A. H. GIBSON.

The Para-Thyreoid Gland and Mental Condition.

DR. E. J. T. THOMPSON, M.C., read a paper entitled "Some Observations on the Para-Thyreoid and its Use in Mental Conditions" (see page 477).

DR. J. BENTLEY, M.C., pointed out that none of the ductless glands except the thyreoid, the para-thyreoid and possibly the thymus proved effective by oral administration. "Insulin" had proved ineffective when so administered and adrenalin did not raise the blood pressure if given by the mouth. Dr. Burton Bradley, of Sydney, had prepared ductless gland extracts for hypodermic injection. These preparations had not yet received a trial.

MR. F. A. HADLEY expressed the opinion that beneficial effects had been noted on the administration of para-thyreoid gland to patients suffering from callous ulcers.

DR. D. M. MCWHAE suggested that interesting results might be obtained by para-thyreoid treatment in patients suffering from *paralysis agitans*. He thanked Dr. Thompson very warmly for his paper before asking him to reply.

DR. THOMPSON in reply to various questions stated that the usual dose of para-thyreoid gland was 0.006 gramme (grain one-tenth). This was given three times a day with 0.6 gramme (ten grains) of calcium lactate. Sometimes, however, as much as six doses of this quantity of para-thyreoid had been given in the twenty-four hours. In regard to the menstrual function it had been noted that amongst several patients suffering from amenorrhœa no resumption of the function had occurred. In reply to a question by Dr. Dale who had referred to Dr. Dunhill's statement as to the difficulty of recognizing the para-thyreoid glands at operation, Dr. Thompson said that recognition was difficult or impossible without microscopical examination. The preparation used in his series of patients had been that of Parke Davis. He quoted a recent article by Vines in which the writer stated that in his opinion this firm's preparation was the most effective.

Annual Meeting of the British Medical Association.

An invitation was read from the President-Elect of the British Medical Association extending a cordial invitation to members of the Branch to attend the forthcoming Annual Meeting of the Association at Bradford, on July 22, 1924.

Lodge Rates.

THE SECRETARY gave a résumé of the position at Albany in regard to lodge rates. He said that the Council had decided that the rate at Albany should be increased from twenty-six shillings to thirty-shillings *per annum*. The action of the Council was endorsed on the motion of DR. F. STEWART, seconded by DR. M. K. MOSS.

NOMINATIONS AND ELECTIONS.

THE undermentioned have been nominated for election as members of the New South Wales Branch of the British Medical Association:

BLACKBURNE, ALAN JOHN, M.B., Ch.M., 1924 (Univ. Sydney), Wyalong Street, Burwood.

BRIGGS, WEBSTER, M.B., Ch.M., 1924 (Univ. Sydney), Albury District Hospital.

BULTEAU, ALFRED WILLIAM JAMES, M.B., Ch.M., 1924 (Univ. Sydney), 91, Lyons Road, Drummoyne.

DUKE, CHARLES LESLIE SWINNERTON, M.B., Ch.M., 1923 (Univ. Sydney), 426, Darling Street, Balmain.

WOODS, JACK MCKENZIE, M.B., Ch.M., 1923 (Univ. Sydney), H.M.A.S. "Adelaide," G.P.O., Sydney.

ANDREW, MARSHALL, M.B., Ch.M., 1923 (Univ. Sydney), Grosvenor Road, Wahroonga.

SMOKE SOCIAL TO NEW GRADUATES.

THE COUNCIL OF THE VICTORIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION entertained the medical graduates at the recent annual examination at a smoke social held at the "Mia Mia" Café, on May 1, 1924.

The function was of an informal character and a happy balance between entertainment and more serious business was maintained.

Agreeable diversion was provided by MR. BELL, an expert in sleight-of-hand and songs were pleasingly rendered by MR. GUY MOORE.

DR. J. W. DUNBAR HOOPER, THE PRESIDENT OF THE VICTORIAN BRANCH, took the chair and in his opening remarks explained that the Council had promoted the function in order that they might meet the men who were at the outset of their career, extend to them a welcome into the brotherhood of the profession and assure them of the desire of the members of the Council to assist them in the various difficulties liable to arise in the course of medical practice.

Dr. Hooper outlined briefly the objectives of the British Medical Association and indicated the various activities of the great world-wide organization. The membership of the Victorian Branch comprised 94% of the medical practitioners of Victoria.

While the primary object of the British Medical Association was to afford its members all possible facilities for keeping abreast of the progress of scientific medicine, there were many other directions in which it could assist the individual practitioner. They would meet in practice problems concerning their relationship to their patients, to other medical men and to the public. He wanted them to realize that the men of experience who composed the Council of the Victorian Branch, were anxious to help them with their advice at all times. He hoped that they would not hesitate to bring their difficulties to the Council who, as a body and as individuals, earnestly desired to help young practitioners.

He would like to see their informal gathering become an annual function.

MR. G. A. SYME in the course of a brief address said that he was in full sympathy with the object of the meeting, which was that young graduates, fresh from their examinations should meet and be pleasantly and informally introduced into the medical profession in Victoria.

They were now graduates of a university and members of a learned profession and he hoped that they would realize that the object of their university training was not merely to equip them to earn a living, but to impart a certain amount of culture.

Experience at a member of the Council of the Medical Defence Association and of the Ethical Committee of the Council of the Victorian Branch of the British Medical Association had shown him that most of the ethical troubles which occurred, and even actions at law arose from men allowing the learned profession to be super-

seded by trade. Mr. Syme drew very clearly the distinction between the practice of the profession of medicine and traffic in "cures" or drugs, which unfortunately was a widely prevalent popular misconception of the function of a medical man.

"If they had the right outlook, their attitude towards the important question of national insurance, for example would be decided by consideration of whether such a system would raise the standard of medical practice rather than the likelihood of resultant increase in their incomes. To those to whom it was unfamiliar, he suggested that they should read Bernard Shaw's play, "The Doctor's Dilemma." In that clever satire which contained a deal of truth, unpalatable though it might be, they would find various types of medical practitioners represented and obtain an insight into pitfalls to be avoided.

Mr. Syme made reference also to an address by Sir Thomas Horder, entitled "Medicine and Old Ethics," which had appeared in *The British Medical Journal*. The keynote of that address was: "Live by old ethics and the classical rules of honesty."

Difficulties arose in practice which were not met by any instruction included in the medical curriculum and perhaps were not covered by the principles of ethics, but such troubles were due in large part to want of consideration for others and lack of brotherhood among practitioners.

The concluding part of Mr. Syme's address dealt with the supreme necessity for thoroughness and care in professional work. More mistakes were made from want of care than from want of knowledge. He urged them to carry the methods inculcated in their hospital training into practice. They could rely on the friendly and cordial support of the profession as a whole and especially of the Council of the Victorian Branch of the British Medical Association.

DR. STANLEY ARGYLE urged the necessity for the cultivation of other than strictly professional attributes. The medical man who could talk nothing other than "shop" was a dull dog and an imperfect citizen. No doubt they would become very busy with professional duties, but his advice to them was that it was worth while to make themselves familiar with the great questions of the day and to take an interest in some branch of literature or art. They should avoid narrowness. They should endeavour as university men to lead in the life of their own centre, enter into the interests of the people and aim to be recognized as men of culture, learning and honesty of purpose. He could assure them that life would hold more for them and they would be the happier for the maintenance of a variety of interests.

Obituary.

JOHN ALOYSIUS O'BRIEN.

JOHN ALOYSIUS O'BRIEN, whose death occurred on March 30, 1924, was born in Glasgow in 1854. He was educated at a school in County Armagh, Ireland, and later entered as a medical student at the Glasgow University. Here he graduated as bachelor of medicine and master of surgery in 1876. In 1878 he arrived in Australia, having served an assistantship for the intervening two years in Sunderland, England.

On his arrival in Australia, John Aloysius O'Brien inaugurated what was destined to become a long and honourable association with the Government Medical Service in Victoria by applying successfully for an appointment in the Lunacy Department. After twelve months, however, he relinquished this position in order to engage in private practice at Beechworth, Victoria, where he remained for two years. He then re-entered the Lunacy Department, eventually becoming Superintendent of the Sunbury Asylum in 1888.

In 1900, upon the retirement of Dr. Andrew Shields, he was appointed Government Medical Officer for the State of Victoria and occupied that position until he retired in 1920. On several occasions he filled the post of Acting City Coroner and after his retirement sat regularly as an honorary justice at the City Court.

His widow, one son and one daughter survive him.

DR. ARCHIBALD BLACK writes:

In 1873 I first met the late Dr. J. A. O'Brien as a fellow student at the Glasgow University. He will be long remembered in Victoria for his conscientious discharge of the duties of Government Medical Officer. This position involved attendance at the Melbourne Gaol, the examination of candidates for appointments in many Government departments and official visits to various lunacy homes.

The medical work of the Melbourne Gaol was regarded as a serious responsibility by Dr. O'Brien; he always remembered that those confined there were not free men and were dependent solely on him for medical advice. Many a telephone message came to me when Dr. O'Brien was evidently uneasy about some prisoner's condition and felt that I might be of assistance to him if I would visit the patient.

Dr. O'Brien, like many a Glasgow graduate, as age matured his judgement, was greatly influenced by the teaching of Professor Gairdner, in whom he saw a man of the best scientific mind, humble when everything was not clear, but faithful that in the future light would appear.

Dr. O'Brien was a consistently religious man and a true Christian gentleman.

MELVILLE BIRKS.

WE regret to announce the death of Dr. Melville Birks, of Broken Hill, which occurred at Adelaide on April 27, 1924.

Correspondence.

"PINK EYE."

SIR: I was interested to read the account of sulphuretted-hydrogen poisoning, with special reference to eye symptoms—"pink eye"—in your issue of May 3, 1924, by Dr. H. Picton Clark and although the condition described is an accurate one, Dr. Clark's deductions must not be passed over without comment.

As this condition of "pink eye" has been brought before the public again quite recently in the Newcastle District owing to an outbreak in one of the local collieries, any remarks on the subject should be carefully weighed, before a definite opinion as to its causation can be stated. I have just completed a report on the present outbreak in Hebburn Number 2 Colliery and together with Drs. Byrne and Harris visited the affected places underground. Although a large amount of clinical material was not presented, seeing that only comparatively few miners were affected, the nature of the affection and its probable cause was gone into thoroughly and an attempt made by examining the conjunctival sacs of affected patients bacteriologically and also their blood. The presence of H_2S was found in the mine mentioned and could be readily demonstrated by its turning lead acetate paper black and also by its characteristic unpleasant odour, but not in concentrated form.

The symptoms complained of were those which Dr. Clark mentioned, *videlicet* conjunctival injection, lachrymation and photophobia, but in all cases examined, no evidence of any respiratory or gastro-intestinal symptoms could be got. Further, any miner who complained of eye symptoms whilst at work or after leaving the pit, was carefully questioned about any irritative symptoms of the nose and throat or stomach trouble and in no case could any evidence of such occurring be elicited. Although the term "pink eye" has been confused sometimes with a mucopurulent conjunctivitis due to the Kock Weeks bacillus, it

was not thought to be due to anything but H_2S in this case. The presence of this gas in the affected areas and the absence of any pathogenic organisms in the cultures from the conjunctiva of the affected patients, lent support to this conclusion. The blood did not reveal any characteristic changes and this agrees with Lehmann's statement.

Dr. Clark states in his article, that it is questionable whether the gas has any direct action on the conjunctiva, unless in a very concentrated form. Lehmann, however, contends that H_2S acts locally as well as indirectly after absorption into the blood stream, which fact Dr. Clark asserts is not borne out clinically in his experience. In the examination which was carried out in February, 1924, the action of H_2S in causing "pink eye" was in my opinion a local reaction. Had it been through the general circulation, one would have expected other mucus surfaces to suffer and if the presence of H_2S was in concentrated form, respiratory and gastro-intestinal symptoms would have occurred and for more toxic phenomena been demonstrated. Such, however, was not the case and apart from some lachrymation, photophobia and irritation of the conjunctivæ, no serious symptoms were evident and the condition subsided in about twenty-four to forty-eight hours after coming out of the pit. I quite realize H_2S can be absorbed into the general circulation if in concentrated form and thus produce conjunctivitis and other toxic symptoms, but in this particular outbreak the action has been a local one and not a general one.

Sulphuretted hydrogen is very soluble, one volume of H_2O dissolves three volumes of H_2S at ordinary temperature and the conclusion we came to in our examination was that the H_2S not being in sufficient quantity to produce any serious toxic symptoms, was absorbed by the moisture in the atmosphere and the sweat on the faces of the men whilst working and thus set up an irritative lesion of the conjunctivæ, which was a local and not a general reaction. I would like to ask Dr. Clark if he does not consider the action a local one, why he objects to castor oil being used as eye drops as a palliative measure "because of the possibility of masking symptoms and getting a fatal dose of poisoning."

Personally, as far as treatment is concerned, I think preventive measures with a free supply of fresh air circulating in the affected areas is the surest way to combat the trouble and local application of bicarbonate of soda to the affected eyes seeing that H_2S in solution is strongly acid.

The condition of "pink eye" is not a new one in this district, several cases being reported many years ago and it has always been safely combated by free ventilation in the affected areas. Fortunately, no serious toxic symptoms have occurred to date and there is every reason to believe the recent outbreak will soon be a thing of the past.

I am much indebted to Dr. Byrne and Dr. Harris for their kindly assistance in investigating this recent outbreak.

Yours, etc.,

Newcastle, May 6, 1924. HUGH G. ALLEN, M.B., Ch.M.

Books Received.

SUNSHINE AND OPEN AIR: THEIR INFLUENCE ON HEALTH, WITH SPECIAL REFERENCE TO THE ALPINE CLIMATE, by Leonard Hill, M.B., F.R.S.; 1924. London: Edward Arnold and Company; Demy 8vo., pp. 138, with eight plates. Price: 10s. 6d. net.

ELEMENTARY PRACTICAL BIO-CHEMISTRY, by W. A. Osborne, Melbourne, and W. J. Young, Melbourne; 1924. Melbourne: W. Ramsay; Post 8vo., pp. 150, interleaved. Price: 12s. 6d. net.

Medical Appointments Vacant, etc.

FOR announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser," page xviii.

ST. GEORGE DISTRICT HOSPITAL, KOGARAH, SYDNEY: Senior Resident Medical Officer.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, 429, Strand, London, W.C.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney	Australian Natives' Association Ashfield and District Friendly Societies' Dispensary Balmain United Friendly Society's Dispensary Friendly Society Lodges at Casino Leichhardt and Petersham Dispensary Manchester Unity Oddfellows' Medical Institute, Elizabeth Street, Sydney Marrickville United Friendly Societies' Dispensary North Sydney United Friendly Societies People's Prudential Benefit Society Phœnix Mutual Provident Society
VICTORIA: Honorary Secretary, Medical Society Hall, East Melbourne	All Institutes or Medical Dispensaries Australian Prudential Association Proprietary, Limited Mutual National Provident Club National Provident Association
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane	Brisbane United Friendly Society Institute Stannary Hills Hospital
SOUTH AUSTRALIA: Honorary Secretary, 12, North Terrace, Adelaide	Contract Practice Appointments at Renmark Contract Practice Appointments in South Australia
WESTERN AUSTRALIA: Honorary Secretary, Saint George's Terrace, Perth	All Contract Practice Appointments in Western Australia
NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington	Friendly Society Lodges, Wellington, New Zealand

Diary for the Month.

MAY 20.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
MAY 20.—Illawarra Suburbs Medical Association, New South Wales.
MAY 21.—Victorian Branch, B.M.A.: Council; Election of Representative on Representative Body.
MAY 21.—Western Australian Branch, B.M.A.: Branch.
MAY 23.—Queensland Branch, B.M.A.: Council.
MAY 23.—South Eastern Medical Association (Bulli), New South Wales.
MAY 27.—New South Wales Branch, B.M.A.: Medical Politics Committee; Organization and Science Committee.
MAY 29.—New South Wales Branch, B.M.A.: Branch.
MAY 29.—South Australian Branch, B.M.A.: Listerian Oration.
JUNE 4.—Victorian Branch, B.M.A.: Branch.
JUNE 6.—Queensland Branch, B.M.A.: Branch.
JUNE 10.—New South Wales Branch, B.M.A.: Ethics Committee.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

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